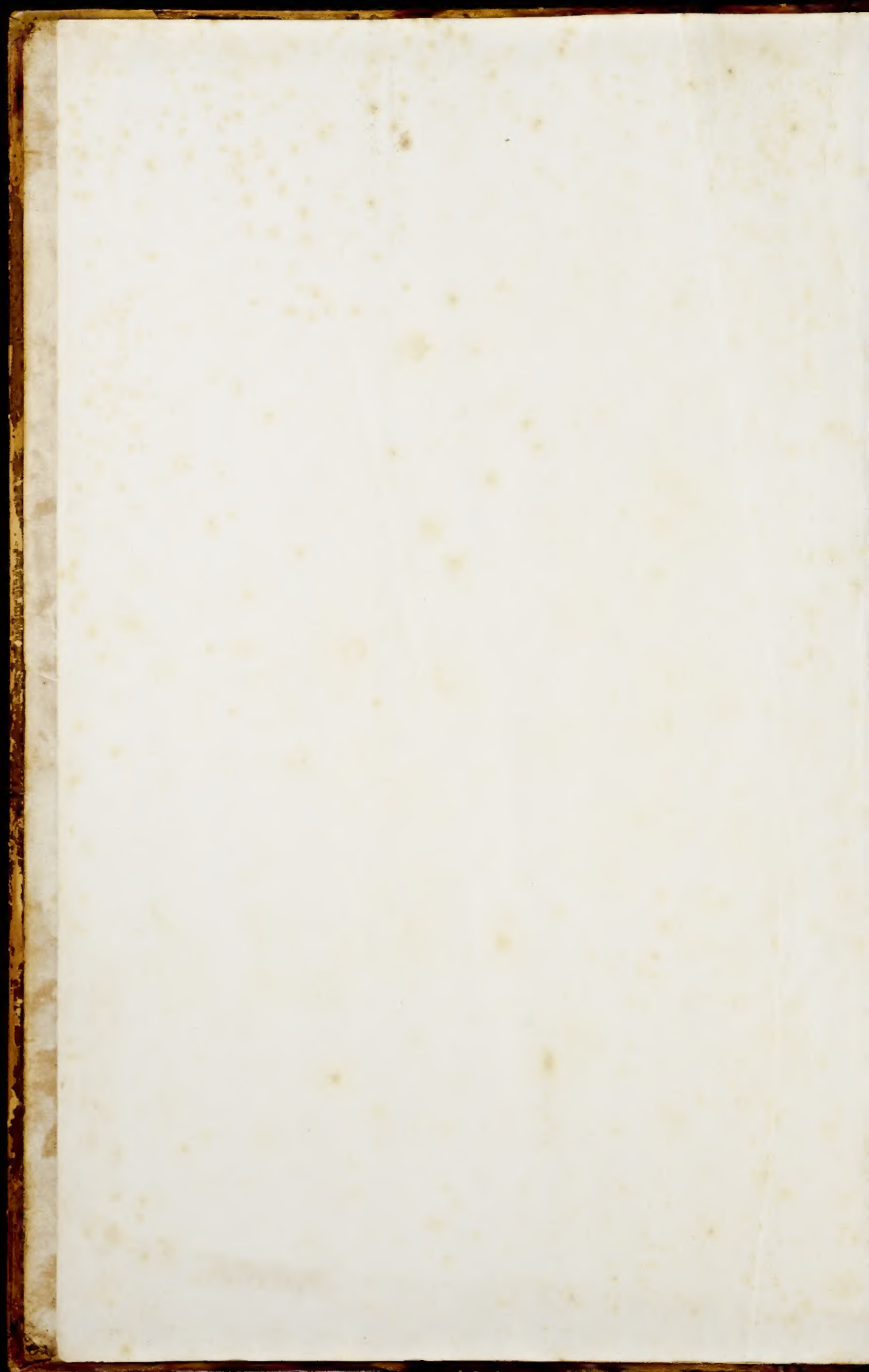


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THE
ARCHITECTURE
OF
A. PALLADIO;
IN FOUR BOOKS.

CONTAINING

**A short TREATISE of the FIVE ORDERS, and
the most necessary Observations concerning
all sorts of BUILDING:**

AS ALSO

The different Construction of PRIVATE and PUBLICK HOUSES,
HIGH-WAYS, BRIDGES, MARKET-PLACES, XYSTES, and
TEMPLES, with their Plans, Sections, and Uprights.

Revis'd, Design'd, and Publish'd

By **GIACOMO LEONI**, a *Venetian*,
Architect to His Most SERENE HIGHNESS, the Late
ELECTOR PALATINE.

Translated from the ITALIAN Original.

THE THIRD EDITION, CORRECTED.

With NOTES and REMARKS of

INIGO JONES:

Now first taken from his Original Manuscript in *Worcester College Library, Oxford.*

AND ALSO,

An **APPENDIX**, containing the **ANTIQUITIES of ROME.**

Written by *A. PALLADIO.*

And a **DISCOURSE of the FIRES of the Ancients.**

Never before Translated.

IN TWO VOLUMES.

L O N D O N:

Printed for A. WARD, in *Little-Britain*; S. BIRT, in *Ave-Mary-Lane*; D. BROWNE,
without *Temple-Bar*; C. DAVIS, in *Pater-noster-Row*; T. OSBORNE, in
Gray's-Inn; and A. MILLAR, against *St. Clement's Church in the Strand.*

M. DCC. XLII.

ARCHITECTURE
A PALLADIO
IN FOUR BOOKS

A NEW TRANSLATION OF THE FIRST BOOK, AND
THE SECOND, THIRD, AND FOURTH BOOKS,
BY THE REV. JOHN BROWN, M.A.
OF THE UNIVERSITY OF OXFORD.
LONDON:
Printed by J. B. ROBERTSON, at the
Museum, in Pall Mall.
1840.

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1840.

A D V E R T I S E M E N T

FROM

The PROPRIETORS of this Third Edition.

THE late Dr. CLARKE, *Member of Parliament for the University of Oxford, being possess'd of an old Edition of PALLADIO'S Architecture, (on which were wrote, by the Famous INIGO JONES, Notes and Remarks on the Plates;) bequeath'd it, with the rest of his Library, to Worcester-College. The Proprietors being inform'd of this, apply'd to the President of the said College, for Liberty to get a Copy of those Notes and Remarks. This Favour was granted, on condition a Person well skilled in Architecture should be sent thither. Mr. JAMES LEONI was prevail'd on to undertake this, went to Oxford accordingly, and transcribed the Notes and Remarks from the Manuscript-Copy of INIGO JONES. Some few of these are placed in the Side-margin, and the rest (which make several Sheets) are added at the end of each Book. This, no doubt, will be esteemed a very great Advantage to this Edition, by all who are Lovers of Architecture, and have a value for the Memory of the Celebrated Architect who made the Remarks.*

AT the end of the Second Volume is added, by way of Appendix, a Tract written by A. PALLADIO, intitled, The Antiquities of Rome, &c. now first translated from the Italian.

AS these Additions have considerably increased the Expence of this Edition, the Proprietors hope they will give a general satisfaction to the Curious.

Preface to the First Edition.

IRESOLV'D from the beginning to spare no Expence, that I might rather surpass the Expectation of my Subscribers, than come any way short of it. This will more evidently appear by the great number of Copper Plates and Designs, which I have added over and above what I promis'd. Such as are true Judges will, by comparing the Draughts of Palladio with mine, easily discern a vast difference. His Wooden Cuts I have chang'd into Copper Plates, which, for the greater Perfection of the Work, tho' much to my own Loss, I have procur'd to be engrav'd in Holland by the famous Monsieur Picart, one of the best Masters of that Art in Europe. I have not only made all the Draughts my self, and on a much larger Scale than my Author; but also made so many necessary Corrections with respect to Shading, Dimensions, Ornaments, &c. that this Work may in some sort be rather consider'd as an Original, than an Improvement. In the mean time I offer my Service, either in Person or otherwise, to such Noblemen and Gentlemen as may have occasion for me in the way of my Profession.

JAMES LEONI.

ANDREA PALLADIO (one of the most Learned Architects that Italy has produc'd, since the polite Arts begun to revive there) was born in *Vicenza*, a Town belonging to the Republick of *Venice*. His Parents were of mean Extraction, but in consideration of his great Abilities, and as a reward for the honour he did his Native City, he was made free of the same, and receiv'd into the Body of the Nobility. He had for his Master the Celebrated *Giovanni Giorgio Trissino*, under whom he not only learnt the most curious parts of Civil and Military *Architecture*, but likewise adorn'd his Mind with all sorts of Erudition. He made it his chief Study to search into the stately Monuments of old *Rome*, which he examin'd with unparallel'd Diligence and Attention. His Posthumous Work of the *Roman Antiquities*, tho' imperfect, does yet sufficiently show how much he made himself Master of the Noblest Ideas of the Ancients: for walking through the rubbish and other remains of these, he discover'd the true Rules of an Art, which till his time were unknown; even to *Michel-Angelo* and *Brunelleschi* his Contemporaries. The Exactness of his Designs can't be too much commended: 'tis pity that the Authors, who have made mention of him, are silent on the particulars of his Life. They have taken great pains in giving us a long List of the fine Buildings wherewith he adorn'd his Country, but to little purpose; since we have them drawn and explain'd by himself, in the second and third Books of his *Architecture*. He flourish'd in the 16th Century, and died in the Year 1580.

T H E

T H E
A U T H O R ' S
P R E F A C E.

MY natural Inclination leading me, from my very Infancy, to the Study of *Architecture*, I resolv'd to apply my self to it: And because I ever was of opinion, that the ancient *Romans* did far exceed all that have come after them, as in many other things so particularly in Building, I propos'd to my self *Vitruvius* both as my Master and Guide, he being the only ancient Author that remains extant on this Subject. Then, I betook my self to the Search and Examination of such Ruins of ancient Structures as, in spight of Time and the rude Hands of *Barbarians*, are still remaining; and finding that they deserv'd a much more diligent Observation than I thought at first Sight, I began with the utmost Accuracy to measure every the minutest part by it self: And indeed, I became so scrupulous an Examiner of them (not discovering that any thing, of this kind, was perform'd, without the justest Reason and the finest Proportion) that I afterwards, not once only, but very often, took Journies to several parts of *Italy*, and even out of it, that I might be able, from such Fragments, to comprehend what the whole must needs have been, and to make Draughts accordingly. Whereupon, considering how widely different the way of Building, commonly in use, is from the Observations I made on the said Edifices, and from what I have read in *Vitruvius*, in *Leo Baptista Alberti*, and other excellent Writers since *Vitruvius's* Time, as well as from Buildings of my own Performance, which rais'd my Reputation, and gave no small satisfaction to those who were pleas'd to employ me; I thought it an Undertaking worthy of a Man who considers that he was not born for himself only, but likewise for the good of others, to publish to the World the Designs (or Draughts) of those Edifices, which with equal Expence of Time and Danger of my Person, I have collect'd; and

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briefly

briefly to set down what seem'd to me most worthy to be consider'd in them; and further, to give those Rules which I have hitherto follow'd in Building, and which I still follow, to the end that they who shall read my Books, may be able to practise whatever they find useful in them, and to supply what is wanting, as many such things there may be. Thus Men, by degrees, will learn to lay aside the strange Abuses, the barbarous Inventions, the superfluous Expences, and (what imports them more than all the rest) to avoid the various and continual Ruins which have happened in several Buildings. I have moreover apply'd my self to this Undertaking with the greater Alacrity, because at this time I see abundance of others become studious of this Profession, many of whom are worthily and honourably mentioned in the Books of that rare Painter and Architect, *George Vasari Aretino*; which makes me hope that the way of Building will be reduced to general Utility, and very soon arrive to that pitch of Perfection, which, in all Arts, is so much desired. We appear to come very near it, in this part of *Italy*, seeing that not only in *Venice* (where all the polite Arts do flourish, and which City alone affords an Example of the Grandeur and Magnificence of the *Romans*) there begin to appear Fabricks of good taste, since that most celebrated Carver and Architect, *Giacomo Sansovino*, first introduced the true manner, as may be seen, not to mention his fine Performances in the new Palace of *Procuracy*, which is perhaps the most sumptuous and the most beautiful Edifice that has been erected since the time of the Ancients; but also in several other Places of less renown, and particularly in the City of *Vicenza*, which tho' of no great Extent, yet is full of very refined Genius's, and sufficiently abounds in Riches. There I had first occasion to put that in practice, which I now publish for the common Good. As here may be seen divers fine Edifices, and many Gentlemen who are most studious of this Art, and who, whether their Blood or their Learning be consider'd, are not unworthy to be number'd among the most Illustrious, such as *John George Trissino*, the Ornament of our Age; the Counts *Marc Antony* and *Adrian de Thieni*, Brothers; *Antenor Pagello*, and many others; who having past to another Life, have eternized their Memory by the curious and rich Buildings they have left behind them. There are now living in the same City *Fabio Monza*, a knowing Person in many Subjects; *Elio de Belli*, the Son of *Valerio*, famous for Painting in Brooch* and Cutting of Crystal; *Antony Francis Oliviera*, who besides the Know-

ledge

* Pictures in one Colour are so call'd.

ledge of many Sciences, is an excellent Architect and Poet, as he has demonstrated in his Heroick Poem, entitled *Alcmena*, and by the House that he built at *Boschi di Nanto*, a place of the *Vicentin*; and finally, to pass over several others that might reasonably lay a claim to the same Rank, *Valerio Barbarano*, a most diligent Observer of whatever any ways belongs to our Profession. But to return to our Subject, having designed to publish to the World the Fruits of those Labours, which, with the greatest Diligence from my Youth upwards, I have been collecting; as also the Searching and Measuring of those Ancient Buildings that any ways came to my Knowledge; and upon this occasion briefly to treat of Architecture in the most orderly and distinct method possible; I thought it most convenient to begin with the Houses of private Persons, as thinking it reasonable to believe, that these in time gave rise to publick Edifices, it being very probable that Men lived first asunder by themselves; and perceiving afterwards that they needed the Aid of others to make them happy, (if indeed there be any Happiness here) they naturally loved and desired the Company of other Men, whence, out of many Houses they made Villages, and out of many Villages Cities, in which they built publick Places and Edifices. Besides, as of all the parts of Architecture, none is more necessary than this for Mankind, nor any more frequently practised by them, I shall therefore in the first place treat of private Houses, and next of publick Edifices. I shall briefly write of Streets, Bridges, publick Places, Prisons, *Basiliche*, or Courts of Justice; *Xisti* and *Palestre*, (which were Places design'd for bodily Exercises) of Temples, Theatres and Amphitheatres, of Arches, of publick Baths, of Aqueducts, and last of all, the manner of fortifying Cities and Havens. In all these I shall avoid superfluity of Words, and will barely remark such things as shall appear to me most necessary, using those Terms and Names that are in common use with our present Architects. And because I dare make no other boasts of my self than what flow merely from the long and earnest Study, great Diligence, strong Passion and Affection wherewith I have pursued the Knowledge and Practice of what I now offer to the World; if it pleases God that I have not *laboured in vain*, I shall be thankful to his Goodness for it with all my heart; acknowledging my self obliged to those, who, from their fine Inventions and Experiments, have left us the Precepts of this Art; since thereby they have opened a more easy and expeditious way to the making of new Discoveries, and that by their means (which we ought thankfully to acknowledge) we are come to the Knowledge of many things, which otherwise had

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perhaps

perhaps remain'd still unknown. This first part shall be divided into two Books; the first will contain the Preparation of the Materials, and being prepared, how, and in what form, to employ them from the Foundations up to the Roof: and here likewise will be contained those general Rules which are to be observed in all Edifices, as well publick as private. In the second I shall treat of the different Qualities of Buildings, so as to make them agreeable to Persons of different Conditions: First of Houses in the City, and next of the most convenient Situations for Country-houses, and how they ought to be most commodiously disposed. But since in this kind, we have but very few ancient Originals, by which to be governed, I shall lay before you the Plans of several Houses I have built for Gentlemen in divers places; and lastly, the Ancients Designs of Country-houses, with those parts in them that were most remarkable, in the manner that *Vitruvius* has taught us, and that they themselves built them.



THE
FIRST BOOK.

CHAP. I.

Of Things to be consider'd and provided, before one begins to Build.

THE first thing that requires our consideration, when we are about Building, is the Plan, and the Upright of the Edifice we propose to erect. Three things, according to *Vitruvius*, are chiefly to be consider'd, without which a Building cannot be of any value. These are *Conveniency*, *Solidity*, and *Beauty*. For no Edifice can be allow'd to be perfect, if it be commodious and not durable; or, if being durable, it be subject to many inconveniencies; or, if having both solidity and conveniency, it has no beauty nor uniformity.

AN Edifice may be reckon'd Commodious, when every part of it has its proper place and situation, in respect to its dignity and uses; having neither more nor less than these require: as when the Halls, Rooms, Closets, Galleries, Cellars, Garrets, &c. are fitly dispos'd, and in their proper places. The Solidity of an Edifice depends upon the care of erecting the Walls very *plum*, and thicker below than above, with good and stout Foundations: taking care that the *pillars* above be exactly perpendicular over the *pillars* below, and that all the openings, as Doors and Windows, be one above the other, so that the solid be upon the solid, and the void upon the void. As for the beauty of an Edifice, it consists in an exact Proportion of the parts within themselves, and of each part with the whole: for a fine Building ought to appear as an entire and perfect body, wherein every member agrees with its fellow, and each so well with the whole, that it may seem absolutely necessary to the being of the same.

THESE things consider'd upon the Draught, or Model, the Charges of the whole are to be diligently computed, and all requisite materials timely provided, that nothing be deficient, or hinder the finishing of the work: it being no little satisfaction and praise to the Builder, nor a small advantage to the work it self, if it is compleated with due expedition, and in all its parts together: because, if all the Walls are rais'd at the same time, they will settle equally every where, and there will be none of those Chinks or Clefs, which are so common in the buildings finish'd at several times. Therefore having made choice of the most skilful Artists that can be had (to the end, that, by their advice, the Work may be better carried on) Bricks, Stones, Lime, Sand, Timber, and Metals, are to be provided in a sufficient quantity; concerning which provision, I intend to lay down some very useful Observations: as for example; for framing the Floor of the Halls and Chambers, so many Joysts are to be provided for, as when fram'd, there may remain between them the space of a Joyst and a half. Likewise concerning Stones, notice ought to be taken, that the *Jambs* of the Doors and Windows are not to be bigger than a fifth, and not less than a sixth part of the opening.

And if the building is to be enriched with *Columns*, or *Pilasters*, the *Bases*, *Capitals*, and *Entablature*, may be made of Stone, and the rest of Bricks. As for the Walls, they ought to diminish according as they rise. These Considerations rightly apply'd, will help to lessen the Expences of the work. But because I am to discourse about all these things in particular, 'twill be sufficient to have given here this general hint as a rough draught of the whole Building. And as the quality and goodness of the materials, are as much to be enquir'd into, as the quantity of them, the experience of those who have built before, will be a great help to determine what is fit and expedient to be done. And tho' *Vitruvius*, *Leo Baptista Alberti*, and other excellent Masters, have given us their opinions of the choice of Materials; yet that nothing be wanting in this Book, I shall subjoin my own Observations to the most necessary of theirs.

C H A P. II.

Of TIMBER.

TIMBER, according to *Vitruvius* (Book 2. Chap. 9.) ought to be cut down in autumn, and during the winter; because the Strength, which, in the spring and summer, was dispers'd through the leaves and fruits of the trees, is then gather'd into the trunk and boughs: and if it is fell'd in the wane of the Moon, then it is free from a certain moisture which is apt to breed worms, and to rot the wood. Timber should be cut at first only to the pith, and so left until it be dry, that the rotting moisture we have spoken of, may the easier drop down and pass away. Being cut, it must be laid under shelter from Sun and Rain, chiefly that sort of wood which grows of it self, that is, without being sow'd or planted, for fear it should chop: and in order to make it grow dry equally, it will be very proper to daub it over with Cow-dung. It should not be drawn home through the Dew, but rather in the afternoon; neither ought it to be wrought, if it is wet or too dry, because it would make it warp and occasion clumsy work: nor will it in less than three Years be dry enough to use it in Planks, Doors, and Window Frames. 'Tis expedient for those who undertake a building, if they want skill in this, to inform themselves from men who are thoroughly acquainted with the nature of Timber, that they may judge which is fit for such or such uses, and which not. *Vitruvius*, in the above quoted Chapter, gives good instructions on that head; besides many more who have written at large on the same Subject.

C H A P. III.

Of STONES.

THERE are two sorts of Stones, natural and artificial. The natural are dug out of the Quarry, and either fit to make Lime (of which we shall speak more at large hereafter) or to be employ'd in making the Walls of Buildings; and of these last there are several sorts. Some extremely hard, as Marble, and such other living Stones, as they are call'd: some less hard, as Free-stone: others soft,

as Chalk. Marble and Free-stone may be wrought as soon as dug, for they will be then more easy to work, since the longer they are out of the Quarry they become the harder. But as to softer Stone, it ought to be dug in summer, be expos'd to the Air, and not to be us'd within two Years; especially when the nature of the Stone is not well known, as when 'tis dug in a place from whence none has been yet taken: for being expos'd to Wind, Rain and Frost, it grows hard by degrees, and more capable to bear the Weather. Another reason why it should be left so long is, that those which are damag'd may be laid aside, to be us'd in Foundations, and other places not expos'd to fight; and that the others which are well season'd may be employ'd in the outside work, because then we may be sure that after such a trial, they will last long.

ARTIFICIAL Stones, which from their form are commonly call'd *Quadrels*, alias *Bricks*, are made of a chalky, whitish, and soft Earth, without any mixture of Clay or Sand, which is to be carefully separated. The Earth is to be dug in autumn, and temper'd in winter, that the Bricks may be moulded in the spring: But if necessity forces to make them in winter or summer, they must be cover'd in winter with dry Sand, and in summer with Straw. When made, they require a long time to dry, and 'tis best to dry them under shelter, that both the middle and the outside may be equally hardned, which can't be done in less than two years. They may be made bigger or smaller, according to the nature and quality of the Building, and the use to which they are design'd. The Ancients made their Bricks for publick and great Buildings, larger than those for small and private ones. The bigger sort ought to have some holes left here and there, that they may dry and burn the better.

The Earth for Bricks must be dug in Autumn, wrought in Winter, and made Bricks in Spring.

CHAP. IV.

Of SAND.

THREE sorts of Sand are commonly us'd in Buildings; Pit-Sand, River-Sand, and Sea-Sand. Pit-Sand is the best of all, and is either black, white, red, or cindry; which last is a sort of Earth burnt by Fire inclos'd in the Mountains, and very common in *Tuscany*. There is also in *Terra di Lavoro*, in the Territories of *Baie* and *Cumæ*, a Sand by *Vitruvius* call'd *Puteolana*, which knits together very soon in Water, and makes Mortar exceeding strong. It has been found by long experience, that of all Pit-Sand, the white is the worst; and of River-Sand, that which is in the rapid streams, and under falls of water, is the best, because it is the cleanest. The Sea-Sand is the worst of all; however it ought to be blackish and to shine like Glass: the biggest and nearest the shore is the best. Pit-Sand being the fattest makes the strongest Mortar, and is therefore to be us'd in Walls and long Vaults, but 'tis apt to crack. River-Sand is very good for *rendring* and *rough-casting* of Walls. But the Sea-Sand, being soon wet and soon dry, and apt to melt away by reason of its Salt, is unfit to bear any weight. The best Sand in its kind of any of these sorts, is that which being handled and squeeze'd between one's Fingers, crackles or makes a noise; or, if being put upon a white cloth, it neither stains nor dirties it. That which mingled with Water makes it slimy and muddy, is very bad: as also that which has for a long

Three sorts of Sand; of Pits, of Rivers, and of the Sea; that of the Pit is the best.

There is another sort of Dust or Sand, in *Italian* called *Pozzolana*, which makes a strong Mortar, and binds presently.

Sea-Sand is the worst of all for Mortars.

long time been expos'd to the Air, Sun, Moon, or Frost; because it gathers much earth and rotten humour, apt to bring forth shrubs and other wild plants, which are very prejudicial to Buildings.

C H A P. V.

Of LIME, and how to work it.

Stones proper to make Lime, are those of Mountains and of Rivers or Torrents, which are good; this Lime is mostly used to plaister the outside Walls; for it makes neat Work, and white.

The Stones for Lime may be burnt in sixty Hours, and must be kept in a moist and shady place.

Three parts of Pit-Sand to be mixt with one of Lime, and two of River or Sea-Sand with one of Lime, for good Mortar.

LIME-Stones are either dug out of Hills, or taken out of Rivers. Those of the Hills are good, if they are dry, free from any moisture, and naturally brittle; having no mixture of any thing in them, which after passing the fire, might make the Stone less. The best Lime therefore is made of the hardest, heaviest, and whitest Stones; and which, being burnt, remain about a third part lighter than before. There is also a sort of spongy Stone, which makes very good Lime, for *rendring* of Walls. In the Hills of *Padua*, they dig a certain rugged and scaly Stone, whose Lime is very good for works expos'd to the Weather, or in the Water, because it hardens immediately, and lasts a long time. All dug Stones are better to make Lime, than the gather'd ones; and rather those that come from a shady and moist pit, than from a dry one; and the white better than the brown. Pebbles, especially white ones, that are gather'd in Rivers and rapid Streams, make excellent Lime; the work done with it is very white and neat, therefore 'tis commonly used in *finishing* of Walls. All stones, of what sort soever, are sooner or slower burnt, according to the Fire given them; but generally they are burnt in 60 Hours. The Lime being taken out of the Kiln, to slack it well, water must be pour'd upon it by degrees, and at divers times, till it is well temper'd. It must be left afterwards in a shady place, without any mixture, only covered lightly with Sand; and when 'tis to be used, the more it is beat and mixt with the Sand, the better and stronger it will be, except that which is made with the scaly Stone of *Padua*; because it must be employ'd as soon as kiln'd, otherwise it wastes and burns away. To make good Mortar, Sand is to be mixt in such a proportion, that one part of Lime be put with three parts of Pit-Sand, and two parts only of River or Sea-Sand.

C H A P. VI.

Of METALS.

THE Metals used in Building are Iron, Lead, and Copper. Iron is fit to make Cramps, Spikes, Nails, Hinges, Bolts, Chains, Locks, and the like works. It is no where found pure; but when the Ore is dug, 'tis purged by the Fire, which renders it liquid; and before 'tis cool, its foulness may be easily taken away. And after it is so purg'd and cool'd, it becomes soft and easy to be wrought and beat out with the Hammer; but it can't easily melt again, except it is put into a furnace made for that purpose. If, being red-hot, it is not quickly beat and work'd, it wastes away. It will be a sign of its Goodness, if being made into Bars, its veins are continu'd strait, without interruption, and if the ends of the Bars are clean and without foil, or scum; because the straightness of its veins shews

shews the Iron to be without knots, puffs, or flaws: and one may judge of the middle by the ends being forg'd into square plates, or any other Figure; and if the sides are even, one may conclude that it is equally good every where, having equally endur'd the Hammer.

LEAD serves to cover magnificent Palaces, Towers, Churches, and other publick Buildings: as also to make gutters and pipes to convey Water. It is likewise used in fastning all manner of Iron-work in Stone, as for example hooks to hang Gates, &c. There are three sorts thereof, white, black, and of a colour between both, call'd by some Ash-colour. The Black is so call'd, not because 'tis really black, but only because it has some black spots intermixt with its whiteness; and therefore to distinguish it from the other sort, the Ancients have call'd it black. The White is the most perfect of the three. The Ash-colour is between both. Lead is dug in great natural Lumps, or in small shining blackish pieces; or else in very thin Leaves which stick in Rocks, Marble, Pebbles, Flints, and other Stones. All sorts of Lead are easily melted, because the heat of the Fire makes it Liquid, before it is red-hot; but if 'tis put into a very hot Furnace, it loses its substance, and changes partly into Litharge, what remains being nothing but scum. Of these three sorts of Lead the black is the softest, and consequently very easily wrought, but it is heavier than the others. The white is harder and lighter; the Ash-colour is much harder than the white, but of a middle weight between both.

COPPER is sometimes used to cover publick Buildings. The Ancients were wont to make a sort of hook, or cramp with it, to fasten the Stones one with another: by the help of those cramps, a Building was rendred a great deal stronger and more durable. The cramps, we now most commonly use, are made of Iron, but the Ancients made them oftner of Copper, because that Metal, being not subject to rust, it lasts longer. The Letters for Inscriptions, which they plac'd in the *Entablatures* of their Buildings, were also made of that Metal, of which several Authors affirm, that the hundred famous Gates of *Babylon* were also made: as likewise the two Pillars of *Hercules* eight Cubits high, in the Isle of *Gades*. The Copper is esteem'd the best, which being drawn from the Mine, and purg'd by the Fire, is red with a yellow cast, and full of Pores; for 'tis a sign of its cleanness, without any dross. Copper may be heated like Iron, and made liquid, so that it may be cast; but if the Fire is too hot, it will not endure it, but totally consume away. This Metal, altho' very hard, is yet very pliable, and dilates it self into very thin Leaves. 'Tis best preserv'd when dipt in Tar; for tho' it does not rust like Iron, yet it has a kind of rust peculiar to it self called *Ver-de-grease*, especially if it touches any sharp moisture. Of this Metal mixed with Tin, Lead, and Latten (which last is another sort of Copper colour'd with *Lapis Calaminaris*) is made a Metal call'd Brass, which oftentimes Architects do use in *Bases* and *Capitals* of Pillars, Statues, Vases, and such like Ornaments. There are at *Rome* four Columns of Brass in the Church of *St. Giovanni de Laterano*, one only of which has its *Capital*. *Augustus* had them cast out of the Brass taken from the Prows of those Men of War, that he took from *Marcus Antonius* in *Epirus*.

THERE remain also in *Rome*, to this day, four ancient Gates, *viz.* that of the *Rotunda*, formerly the *Pantheon*: that of *St. Adriano*, which was the Temple of *Saturn*: that of *St. Cosmo* and *Damiano*, which was the Temple of *Castor* and *Pollux*, or rather of *Remus* and *Romulus*; and that of *St. Agnes*, without the Gate *Viminalis*. But the finest of all these, is that of *St. Maria Rotunda*, wherein

the Ancients endeavour'd to imitate by art that kind of *Corinthian* Metal, in which the natural Colour of Gold did prevail; for we read that when *Corinth* was destroy'd and burnt, all the Gold, Silver, and Copper, which was in that flourishing City, being melted and mix'd together into several lumps, they were so variously temper'd, that it made the three sorts of Metal, which afterwards were called *Corinthian*. That, in which Silver prevailed, remain'd white; where Gold, it took the yellow; and the third was that, in which all these three Metals were of a pretty equal quantity. These three sorts of Metal have been since imitated by Workmen, in many different ways.

HITHERTO having discours'd of those things which are to be consider'd and provided, before one thinks of Building, it now remains that something be said of Foundations, since the Work by them must begin.

C H A P. VII.

Of the Qualities of the Ground, wherein Foundations are to be laid.

WHAT we call the Foundation of a Building is properly the *Basis* of it, that is to say, that part which is under Ground, and supports what appears above. Of all the faults therefore which are committed in Building, those about the Foundations are the most prejudicial to it; because they endanger the whole Fabrick, and they can't be rectify'd without great difficulty and expence. The Architect therefore ought to be extraordinary nice in the setting of the Foundation, since in some places it is solid enough from the nature of the Soil, and in other places it is necessary to be made so by Art.

A NATURAL Foundation is, when the Soil is rocky, or of a soft sandy Stone, or Gravel; for then without digging, or other helps of art, the earth it self is an excellent Foundation, and capable to bear the greatest Building both in Land and Water. But if nature affords not a Foundation, it must be compass'd by Art; and then the place to build upon, is either a solid Earth, or Clay, or 'tis Sand, or soft and moist Ground, or marshy Land. If the Earth is firm and solid, one may dig so far as to a discreet Architect may seem requisite for the quality of the Building, and the soundness of the earth it self. If no Cellars or other underground Offices are intended, a sixth part of the height of the Building may be a sufficient depth. One may judge of the firmness of the Earth by digging of Wells, Cisterns, and such like. 'Tis also known by Herbs growing upon the place, as if such do usually grow only in firm and solid Ground; or if a great weight be thrown thereon, it neither resounds nor shakes; and from the report of a Drum, being set on the Ground, and if lightly touch'd, it does not sound again; or if Water put in a vessel does not shake. The neighbouring places will also help one to know the firmness of the Earth. But if the place be sandy or gravelly, it is to be consider'd whether it be on Land or in Water; because if it be on Land, it will be sufficient to observe what has been already said concerning solid Ground: but if you are to build in Water, the Sand, or Gravel is altogether useless; because the Water, by its continual stream and flood, changes its Bed. Therefore one must dig till a solid bottom is found; but if that can't be done, or is judg'd to be difficult, then dig somewhat in the Sand or Gravel, and so drive Piles whose ends may reach to the sound and good Earth, and upon those

Piles

Chap 7, 8. *Of the Qualities of Ground for Foundations.* 7

Piles cover'd with Planks one may venture to build. But if there is a necessity to build upon a loose or made Ground, then one must dig as far as the solid and sound Earth, and therein also in proportion to the bigness of the Walls, and the greatness of the Building.

THE solid ground fit to build upon, is of divers sorts; for, as *Leo Baptista Alberti* well remarks, it is in some places so hard as scarce to be open'd with the proper Tools, nay sometimes as hard as Iron it self: in other places blackish, in some places whitish, which is accounted the weakest; in some places like Chalk, in others Sandy. Of all these the best is that which is cut with more difficulty, or if being wet, it does not dissolve into dirt.

No Foundation ought to be dug on the Water-side, before one has carefully founded the bottom. If it is marshy and soft, then it ought to be strengthen'd with Piles, whose length must be an eighth part of the height of the Wall, and thick by a twelfth part of their length. The Piles must be drove in as close as possible, and ramm'd with blows rather quick than heavy; so that the Earth may the better consolidate and fasten. Not only the Out-Walls are to be supported in that manner, but also the inner and cross-Walls; for if the Foundation for the inward-Walls differ from those without, then laying the Girders along one by the other, and the Joists cross upon them, it may happen that the inward Walls shall sink, when at the same time, the Out-Walls being upon Piles, shall not stir: both of them consequently will crack, and cause the ruin of the whole. Therefore the Expence of the Piles being less to be fear'd than the falling of the Building; the Piles must not be spar'd, but distributed according to the proportion of the Walls, those in the middle being plac'd somewhat thinner than those without.

C H A P. VIII.

Of FOUNDATIONS.

THE Foundations ought to be twice as thick as the Walls to be rais'd upon them, so that both the quality of the Earth and the greatness of the Building are to be regarded, making the Foundation larger in a soft and loose Ground, or where there is a great weight to be supported. The *plane* of the Trench must be level, so that the weight may press equally every where; and not inclining more on one side than the other, which occasions the cleaving of the Walls. For this reason the Ancients used to pave the *plane* with *Tivertine*, but we most commonly use to lay Planks or Beams to build on. The Foundations ought to be made sloping, that is to say, to diminish as they rise; but yet in such a manner, that the middle of the Wall above may fall *plum* with the middle of the lowest part; which must be also observ'd in the diminution of Walls above Ground, because by that means the Building becomes much stronger, than by making the diminution any other way.

SOMETIMES to avoid Charges (especially in moorish Grounds, where there is a necessity to use Piles) Foundations are arch'd like a Bridge, and the Walls are built upon those Arches. In great Buildings 'tis very proper to make vents through the body of the Walls from the Foundations to the Roof, because they let forth the Winds and other Vapours, which are very prejudicial to Buildings; they lessen
the

the Charges, and are of no small conveniency, especially when there is occasion for winding-stairs from the bottom to the top.

C H A P. IX.

Of the several sorts of Walls.

THE Foundations being laid, it remains that we treat of the Elevation of the Walls above ground. The Ancients had six sorts of Walls, one of which call'd *Reticulata*, or *Net-work*: another of *Quadrals*, or Bricks: the third of *Cement*, which is a mixture of Flints, or Pebbles and Earth roughly laid with, or without Morter: the fourth made of various Stones, and call'd *Rustick*: the fifth of squar'd Stones: the sixth called *Rimpiuta*, or *Coffer-work*. The *Net*, or *Chequer-work* is no more in use at this time; but because *Vitruvius* relates that it was common in his time, I would not omit to give here the design of it.

THE Corners of the Building, or Wall, were made of Bricks; and between every two Foot and a half, three courses of Bricks were laid as a band to the whole work.

P L A T E I.

A. Corners of Bricks.

B. Courses of Bricks which bind the whole Wall.

C. The *Net* or *Chequer-work*.

D. Courses of Bricks through the thickness of the Wall.

E. The inward part of the Wall made of Cement.

BRICK-WALLS, both those which inclose a City, and those designed for a great Edifice, must be fac'd on both sides with Bricks, and the middle fill'd up with Cement, ramm'd together with Brick-bats: and to every three Foot in height there must be three courses of Bricks of the biggest sort through the whole breadth of the Wall; the first course being laid the lesser part out-side; the second the length laid side-way; the third as the first; and so forth. Of this sort are the Walls of the *Rotunda* in *Rome*, and the Bath of *Diocletian*, and most of all the other ancient Buildings.

P L A T E II.

E. Courses of Bricks which bind the whole Wall.

F. The middle part of the Wall made of Cement.

THE walls of *Cement* must be order'd in such a manner, that to every two Foot at least, there be three courses of Bricks dispos'd as before. The Walls of *Turin* in *Piemont*, have been made after that manner, that is of large River-pebbles split in the middle, which, being laid with the split-side outwards, make very smooth work and agreeable to look upon.

THE Walls of the *Arena* in *Verona* are likewise of Cement, and to every three Foot, there are three courses of Bricks. In like manner are built many ancient Edifices which I have mention'd in my book of *Antiquities*.

P L A T E III.

G. Cement, or River-Pebbles.

H. Courses of Bricks which bind the whole Wall.

THE Walls made of uncertain, or irregular Stones of different sorts, were call'd *Rustick*, by reason of the various shapes of the Stones. In the building of these Walls they made use of a leaden Rule, which being bended according to the place where the Stone was to be laid, shew'd how it was to be form'd and squar'd;

so

so that without any more ado, the Stone was fix'd in its design'd place. Of this sort may be seen the Walls at *Preneste*, and the ancient Streets were paved in this manner.

P L A T E IV.

I. *Irregular or Rustick Stones.*

WALLS of Free-stones may be seen at *Rome* in that place, where were formerly the *Piazza* and the Temple of *Augustus*, in which the lesser Stones were inclos'd with some Courfes of greater ones.

P L A T E V.

K. *Courfes of lesser Stones.*

L. *Courfes of larger Stones.*

THE Ancients used to make Walls called *Reimpiuta*, that is fill'd up with ragged Stones, which is also call'd *Coffer-work*, taking Planks and placing them edge-way in two rows distant one from another, to the thickness they intended to give the Wall; filling the space between those two rows of Planks with *Cement*, Stones of all sorts, Earth and Mortar mingled together: and so they went on from Courfe to Courfe. Such Walls are seen at *Sirmion* upon the Lake *di Guarda*.

P L A T E VI.

M. *Planks put edge-way.*

N. *The inward part of the Wall.*

O. *The Face of the Wall, the Planks being taken away.*

OF this kind may be call'd the ancient Walls of *Naples*, which are made of two rows of free Stones four Foot thick, and six Foot distant the one from the other: these two rows of Stones are bound together with other crossing-rows, so the Space or *Coffers*, which were between the crossing-rows and the out-rows of Stones, being four foot square, were fill'd up with Stones and Earth.

P L A T E VII.

P. *The outward-rows of Stones.*

Q. *The crossing-rows.*

R. *Coffers filled with Stones and Earth.*

THESE, in a word, are all the forms which the Ancients gave to their Walls, the Foot-steps whereof are yet to be seen; from whence one may easily conclude, that Walls of what sort soever they be, ought to have some chief courfes of a larger and harder matter than the rest, to serve like Sinews to hold fast all the other parts together, which chiefly is to be observ'd, when Walls are made of Bricks: to the end that, if in process of time the Walls should happen to sink, or give more on one side than the other, the rest might not become likewise ruinous: as has happen'd in many Walls, especially on that side that looks towards the North.

C H A P. X.

Of the Method which the Ancients did practise, in erecting their Stone-Buildings.

WHEREAS it happens sometimes that Buildings are made, the whole, or a good part of Marble, or of some other great Stones; I think it very proper here to explain what the Ancients did on such occasions, because it is to be observ'd in their Works, that they were so nice in the joining of their Stones together, that sometimes the Joints are difficult to be perceiv'd: which every one ought carefully to consider, who, besides the Beauty, desires also the solidity and lastingness of the Work. As far as I can understand, they first squar'd and wrought those sides of the Stones, which were to be laid one upon the other, leaving the other sides rough, so that the edges of the Stones being thicker, men might move them with less danger of breaking or bruising them, than if they had been squar'd, and consequently thinner, on all sides before. In this manner they made their Stone Buildings *rustick*, or rather rough, till they had quite erected them to the very top; after which they went on working and polishing that face of the Stone which was expos'd to the sight. It is true that the *Roses* which are between the *Modillions*, and such other like Ornaments of the *Cornice*, which could not conveniently be work'd after the fixing of the Stones, were made before while they lay on the Earth. This may be easily observ'd in several ancient Edifices, where many Stones remain rough and unpolish'd, just as they were laid. The Arch near the old Castle in *Verona*, and all the other Arches and Buildings there, were done in the same manner; as it appears by the very marks of the Tools, which shew how the Stones were wrought. The *Trajan* and *Antonine* Columns at *Rome* were also wrought in that manner; otherwise they could never have so exactly join'd the Stones, as to meet so closely cross the Heads, and other parts of the Figures. The same I say of other Arches that are to be seen. When they went about some great piece of Building, as the *Arena* in *Verona*, the Amphitheatre of *Pola*, and the like, to save the excessive charge and length of time, which the finishing of such Works would have requir'd, they wrought only the *Imposts* of the Arches, the *Capitels* and *Cornices*; and left the rest *rustick*, having only regard to the beauty of the whole Fabrick. But in their Temples, or rather sumptuous Buildings, which requir'd more Curiosity, they spar'd no pains nor cost in the working them; polishing and glazing even to the very *Channeling* or *Flutes* of the Columns, with great exactness. Therefore in my judgment, Brick-walls ought not to be *rusticated*, much less the Mantles of Chimneys, which require the most curious Workmanship: for besides the misapplying of that sort of work, it would look as if one had a mind to make a thing, which naturally ought to be entire, appear to be divided and made of several pieces. But indeed, according to the greatness and quality of the Building, it may be made either *rustick*, or after a more elegant manner: for what the Ancients did with Reason, when they were necessitated by the greatness of their Edifices; we ought not to imitate, when smaller Buildings require neatness.

C H A P. XI.

Of the Diminution of the Walls, and the parts of the same.

IT is to be observ'd, in the erecting of the Walls, that they ought to diminish proportionably, as they are rais'd and grow higher. That part therefore which appears above Ground, is to be one half thinner than the Foundations; and the second Story half a Brick thinner than the first Story, and so successively to the top; but still with such discretion, that the upper-moſt part of all be not too weak. The middle of the upmoſt Wall ought to be perpendicular with the middle of the nethermoſt, ſo that the whole Wall becomes of a *pyramidal* form. But if there is a neceſſity to make one of the two ſuperficies of the Walls *plum*, it muſt be inwardly; becauſe the Floors, the Vaults, the croſs-Walls, and other Supporters of the Building, will keep the out-Walls from falling, or giving way. The diſcharg'd parts of the outſide may be cover'd with a *Faſcia* or *Cornice*, incompaſſing the whole Building, which will be both an Ornament and a Binding to the whole Fabrick.

THE Angles, being common to two Faces, in order to keep them upright and faſt together, muſt be made very ſtrong, and held with long and hard Stones as it were with Arms: wherefore the Windows, and other like openings, ought to be made far from the Angles; or at leaſt ſo much ſpace muſt be left between them and the ſaid openings, as is the breadth of any of the openings.

HAVING ſpoken hitherto of mere Walls, 'tis now time we ſhould paſs to their Ornaments, the greateſt of all which are the *Columns*, when they are fitly plac'd, and in their due proportion with the whole Fabrick.

C H A P. XII.

Of the five Orders uſed by the Ancients.

THE ancient Architects have made uſe of five different Orders call'd by them, the *Tuſcan*, *Dorick*, *Ionick*, *Corinthian*, and *Compoſite* Orders. Theſe, in a Building ought to be diſpos'd in ſuch a manner, that the ſtrongeſt be always ſet lowermoſt, as being more capable of bearing the weight, and alſo to give the Building a more ſure Foundation: wherefore the *Dorick* muſt always bear the *Ionick*, the *Ionick* the *Corinthian*, and the *Corinthian* the *Compoſite*. The *Tuſcan* is ſo rude and material, that it is ſeldom uſed above ground, unleſs it be for a *Ruſtick* Edifice of one Order only; or in ſome vaſt Building, as *Amphitheatres* and ſuch like, which having many Orders one upon the other; this, inſtead of the *Dorick*, is plac'd under the *Ionick*. But if an Architect has a mind to leave out one of them, and place (for Example) the *Corinthian* immediately over the *Dorick*, it may be done; provided always, according to the rule aforeſaid, that the more ſolid be the loweſt. I ſhall ſet down the meaſures and proportions of each of theſe Orders, not ſo much according to *Vitruvius*, as to my own Obſervations on the ancient Buildings: But firſt it ſeems neceſſary to explain thoſe things which belong to all the Orders in general.

C H A P. XIII.

Of the swelling and diminution of Columns and Pilasters, which divide and support the Arches.

*THE Columns of every Order agree in this, that the upper part is to be lesser than the lower, with a little swelling about the middle. In the diminishing of them it must be observ'd, that by how much longer they are, by so much the less they must diminish, because the height has already the effect of diminishing them by the distance. Therefore if the Column is 15 Foot high, the Diameter of it, towards its *basis*, must be divided into 6 half parts, to give 5 halves of them to the diameter next to the *Capitel*. If the Column be from 15 to 20, the said diameter below shall be divided into seven parts, 6 halves of which must be the diameter above. So likewise in those from 20 to 30 the lower diameter ought to be divided into 8 parts, and 7 of them shall be the upper diameter: and so proportionably for the highest, as *Vitruvius* teaches in his 2d Chapter of his 3d Book. But as to the method of making the *swelling* part of the Column, we have no more from that Author, but a bare promise, and therefore many have written as they thought best upon that subject. For my part, I am wont to make the profil of the said *swelling* in this manner. I divide the *shaft* of the Column into three equal parts, drawing the lower third part perpendicular, at the extremity of which I lay a thin bending Rule, as long as the Column, or a little more; and bending that part of the Rule, till the end touches at the point of the diminution under the *Collarino*, or *Astragal*, I follow the bent of the Rule, and so the Column becomes somewhat swelled in the middle, and diminishes towards the top very handsomely. And altho' I could not contrive a shorter, or easier way, or which has a better success in practice; yet I was the more confirm'd in this method, since after having told *Peter Cattaneo* of it, he was so much pleas'd with it, that he has mention'd it in his fine Treatise of Architecture, with which he has not a little illustrated our Profession.

AB. *The third part of the Column which is perpendicular.*

BC. *The two thirds which are gradually diminishing.*

C. *The point under the Collarino or Astragal, where the Diminution ends.*

THE *Inter-columns*, that is to say, the spaces between the Columns, may be made of a diameter and a half of the Column (the diameter being always taken at the lower part of the Column) or of two diameters, of two and a quarter, sometimes of three, and sometimes of more. The Ancients notwithstanding never gave more than three diameters, except in the *Tuscan* Order; in which, the *Architrave* being made of Timber, they kept the *Inter-columns* very large: but on the other hand, they never made them less than a diameter and a half; they allow'd this space, especially when the Columns were to be extremely high. But amongst such variety of *Inter-columns*, that of two diameters and a quarter was look'd upon as the most noble and most beautiful of all.

THIS of absolute necessity, to keep a certain proportion between the Columns and the *Inter-columns*: for leaving too much vacancy between small Columns, they will lose a great deal of their Beauty, because too great a quantity of Air between them, diminishes considerably their thicknes: and on the contrary, in leaving too little space between great Columns, the streightness of the vacancy will make them appear too thick, and without any grace. Therefore if the spaces exceed three diameters, the Columns ought to have in thicknes the seventh part of their height, as I shall observe hereafter in the *Tuscan Order*. But if the spaces are to be of three diameters, the length of the Columns must be 7 and a half or 8, as in the *Dorick Order*: if 2 and a quarter, the length of the Column must be 9, as in the *Ionick*: if 2 only, the Column must be 9 and a half, as in the *Corinthian*: lastly, if 1 and a half, the Column shall have 10 diameters, as in the *Composite*. Upon these Orders I have made such Observations, that they may serve for Examples in all the *Inter-Columns*, which *Vitruvius* has mention'd in the 2d Chapter of his 3d Book afore said.

IN the front of Buildings the Columns ought to be an even number, that so the middle *Inter-column* being left bigger than the rest, the Doors and Entries, which are usually placed in the middle, may be the better seen; and thus much for single Pillars, or *Colonnades*. But if Galleries are to be made with Arches and Peers, the Arches must be dispos'd in such a manner, that the *Pilasters* or *Peers* between the Arches, be no less than a third part of the vacancy between two Pilasters, and those at the corner must be two thirds of the said vacancy, that the Angles of the Building may be so much the firmer and stronger. And when they are to support an extraordinary weight, as in a very large Fabrick, then they must be the half of the vacancy, which may be seen in the Arch of *Vicenza*, and in the Amphitheatre of *Capua*: or else two thirds, as those of the Theatre of *Marcellus* at *Rome*, and in that of *Ogubius*, which now belongs to *Ludovico de Gabrielli* a Gentleman of that City. The Ancients made them sometimes as large as the whole space, as in the Theatre of *Verona*, in that part which is not on the Hill. But in private Buildings, they are not to be made less than a third of the space, nor larger than two thirds; and altho' they ought to be square, yet to save charge, and to make more room to walk by, they may be made less in the Flank than in the Front: and to enrich the same, Half-Columns, or Pilasters, may be put in the middle, to bear the great Cornice above the Arches; which Half-Columns, or Pilasters, must be as large as their height requires, according to their several Orders, as it will appear in the ensuing Chapters and Designs. For understanding of these (that I may not repeat the same thing over and over) it must be observ'd, that in dividing and measuring the said Orders, I did not think fit to make use of any determinate measure peculiar to any particular City, as a *fathom*, *foot*, *span*, or the like, knowing that measures are as various as the Cities and Countries themselves: but in imitation of *Vitruvius*, who divides the *Dorick Order* with a measure taken from the diameter of the Column, common to all (and by him called a *Module*) my measure in all the Orders shall be the diameter of the Column taken at the base, and divided into 60 parts, or minutes; except in the *Dorick*, in which the *module* is to be the half diameter of the Column, and is divided into 30 parts, because it so falls more commodious in the divisions of that Order. Therefore every one may divide the *module* into as many, or as few parts as may be thought most convenient, according to the bigness, or smallness of a

Building; and use the proportions and *profils* which I have here design'd for each Order.

C H A P. XIV.

Of the TUSCAN Order.

*THE *Tuscan* Order, according to what *Vitruvius* writes of it, and what it is in effect, is the plainest and most simple of all the Orders of Architecture; because it retains more of the ancient simplicity of the first Architects, who had not yet invented those Ornaments that render the other Orders so pleasant and so worthy of consideration. This Order draws its original from *Tusany*, a Country very remarkable in *Italy*, where it still preserves its name.

THE Column with its *Base* and *Capitol*, ought to be in length seven *Modules*, and the top diminish'd by a fourth part of its bigness. If one is to make a row of Columns of this Order only, the *Inter-columns* may be kept very large, because the Architraves are commonly made of Timber; and for that reason, this Order will be very convenient for a Country-building, for the going in and out of Carts, and other Country conveniencies, besides that the charge will be less considerable.

A. *Architrave of Timber.*

B. *The ends of the Traves, or Joys which make the Corona.*

† BUT if one would make Gates, or Galleries with Arches, then the measures, which I have mark'd in the design, must be strictly observ'd, wherein the Stones are so dispos'd and join'd together, as I think they ought to be, when the whole work is to be made of Stone. The same observation I have made for the four following orders; and this way of disposing and fastening the Stones, I have taken from many ancient Arches, as will appear in my book of *Arches*, wherein I have used the utmost care and diligence.

** THE *Pedestals* to be made under the Columns of this Order, must have a module in height, and be made plain. The *Base* is to be in height the half diameter of the Column; and this height is to be divided into two equal parts, whereof one is given to the *Orlo* or *Plinth*, which must be made round, or square according to some. The other is divided into four parts; one for the *Lifella*, or *Cincture*, which sometimes may be made a little less. In this Order only, it makes a part of the *Base*, for in all the others, it is join'd with the *shaft* of the Column. The other three parts are for the *Torus*. The projecture of this *base* is a sixth part of a *module*, or of the diameter of the Column. The *Capitel* is likewise the height of half the diameter of the Column below, and is divided into two or three equal parts: one is given to the *Abacus*, which from its form, is commonly call'd *Dado*, or *Dye*; the other to the *Ovolo*, and the third is subdivided into seven parts. Of one is made the *Lifella* under the *Ovolo*, and the other six remain for the *Collarino*, or the *Neck* of the Column. The *Astragal* is double the height of the *Lifella* under the *Ovolo*, and its center is made upon the line which falls *plum* from the said *Lifella*, the projecture of which falls perpendicularly upon the *Lifella* or *Cincture*, below the *Astragal*, which is as thick as the other. The projecture of the *Capitel* answers to the body of the Column below. Its *Architrave* is made of wood, square every way, and its breadth is not to exceed the

* Plate IX.

† Plate X.

** Plate XI.

the body of the column at the top. The *Traves*, or *Joysts*, which bear the *Eaves*, project a fourth part of the length of the Column. These are the measures of the *Tuscan* Order, as taught by *Vitruvius*.

- A. *Abacus*.
- B. *Ovolo*, or *Echinus*.
- C. *Collarino*, or *Frise* of the *Capitel*.
- D. *Astragal*.
- E. *The Body of the Column above*.
- F. *The Body of the Column below*.
- G. *Listella*, or *Cincture*, or *Annulet*.
- H. *Torus*, or *Tore*.
- I. *Orlo*, or *Plinth*.
- K. *Pedestal*, or *Stylobatum*.

The *Profils* mark'd L. are the *imposts* of the *Arches*.

* BUT if the *Architrave* is to be made of *Stone*, what was said before of the *Inter-columns* must be observ'd. There are to be seen some ancient Buildings, which may be said to have been built according to this Order, because they retain in part the same measures, as in the *Arena* of *Verona*, and the *Arena* and Theatre of *Pola* and many others, of which I have drawn the *Profils* of the *Basis*, *Capitels*, *Architraves*, *Frieses*, and *Cornices*, which are in the last Plate of this Chapter, as those of the *Imposts* of the *Vaults* and *Arches*; of all which I shall put the designs into my Book of *Antiquities*.

- A. *Cimafium*, or *Cima recta*.
 - B. *Corona*.
 - C. *Cima recta*.
 - D. *Cavetto*.
 - E. *Frize*.
 - F. *Architrave*.
 - G. *Cimafium*.
 - H. *Abacus*.
 - I. *Cima recta*.
 - K. *Collarino*, or *Hypotrachilum*, or *Frize* of the *Capitel*.
 - L. *Astragal*.
 - M. *Body of the Column towards the Capitel*.
 - N. *Body of the Column, towards the Basis*.
 - O. *Annulet*, *Listella*, or *Cincture*.
 - P. *Torus*, or *Tore*, in the form of a *Cima reversa*,
 - Q. *Orlo*, or *Plinth*,
- } of the *Capitel*.
- } of the *Basis*.

On the right hand of the profil'd *Architrave*, mark'd F, I have given the *Profil* of another more curiously done.

* Plate XII.

C H A P. XV.

Of the DORICK Order.

Palladio is mistaken; for the Colonies that went into Asia were Athenians, and afterwards call'd Ionians, from Ion their General. They imitated the Temples which they saw among the Dorians, and call'd them Dorick.

THE Dorick* Order was invented by the Dorians†, and named from them; being a Grecian People, which dwelt in Asia. If these Columns are made alone without Pilasters, they ought to be seven and a half, or eight diameters high. The Intercolumns are to be little less than three diameters of the Columns: and this manner of spacing the Columns, is (by Vitruvius) call'd *Diastylis*.

† BUT if they are join'd to Pilasters, they must be, together with the *Basis* and *Capitel*, seventeen *modules* and one third high: that is, eight diameters and 35 parts: for it must be observ'd, that (as I have said before in the 13th Chapter) the *module* in this Order, is the half of the diameter of the Column, divided into thirty parts; tho' in all the other Orders, it is the whole diameter divided into 60 parts.

** AMONG the Ancients there was no *Pedestal* to this Order, tho' the modern Architects have adapted one to it. Therefore if one has a mind to join a *Pedestal*, the *Dado*, or *Dye* of it, must be a perfect square, and from its measure those of its Ornaments shall be taken: in order to this, the *Dye* is to be divided into three equal parts; the *basis*, with its *socket* or *plinth*, shall take two of them, and the *Cimassum* one; to which the *Orlo*, or *plinth* of the *basis* of the Column must be join'd. This kind of *Pedestal* may be seen in the *Corinthian* Order, as at *Verona* in the Arch call'd the Arch de *Lioni*. I have set down here several manners of *Profils*, which may be fitted to the *Pedestals* of this Order, which are all very agreeable, taken from ancient pieces, and very carefully measured. This Order has no proper *basis*: wherefore in many Buildings, its Columns are without a *basis*, as in the Theatre of *Marcellus* in *Rome*, in the Temple de la *Pieta* near the said Theatre; in the Theatre of *Vicenza*, and in divers other places. But sometimes the *Attick basis* is join'd to it, which is a great ornament to the Order, the proportion whereof is as follows. The height is the half diameter of the Column, and is divided into three equal parts: one is for the *Zocco* or *plinth*: The other two are subdivided into four parts, of one is made the *Torus superior*: the three remaining are again subdivided into two, one for the *Torus inferior*, and the other for the *Scotia* or *Cavetto*, with its *Annulets*, or *Lifstellas*; which have also their peculiar measures: for in dividing the whole into six parts, the two *Annulets*, or *Lifstellas* take each of them one, and the four remaining are for the *Scotia*. The whole projecture of the *basis* must be the sixth part of the diameter of the Column; the *Cincture* is as broad as half of the *Torus superior*: if it be divided from the *basis*, its projecture must be the third part of the whole projecture of the *basis*. But if the *basis* and a part of the Column must be of a piece, the *Cincture* must be smaller; as it may be seen in the third design of this Order, where I have also drawn two manners of *Imposts* for Arches.

A. The Body of the Column.

B. *Annulet*, or *Cincture*, or *Lifstella*.

C. Upper

* Plate XIII.

† Plate XIV.

** Plate XV.

- C. Upper Torus.
- D. Cavetto, or Scotia with its Annulets, or Liffellas.
- E. The lower Torus.
- F. Zocco, or Plinth.
- G. Cimaſum,
- H. Dado, or Dye, or Square,
- I. Baſis,
- K. Impoſts of Arches.

} of the Peđeſtal.

* THE *Capitel* likewiſe ought to have in height the half diameter of the Column, which being divided into three principal parts, the firſt above is ſubdivided into five, three are for the *Abacus*, and the other two for the *Cimaſum*; which being again ſubdivided into three, the *Liffella* takes one, and the *Cima recta* the other two. The ſecond principal part is divided into three, one of which is given to the three *Annulets*, or *Liffellas*, that are equal; the other two are for the *Ovolo*, whoſe *projecture* is two thirds of its height. The third and laſt principal part, is for the *Frixe* of the *Capitel*, call'd *Collarino*, or *Gorgerin*, or *Collar*. The whole *projecture* of the *Capitel* is the fifth part of the diameter of the Column. The *Aſtragal* is of the ſame height with the three *Filets*, or *Annulets*; and is equal in its *projecture* with the loweſt part of the Column. The *Annulet* is only half the height of the *Aſtragal*, and its *projecture* is *pl.m* with the Center of it.

THE *Architrave* is placed upon the *Capitel*, and is to be in height a *module*, or half the diameter of the Column. 'Tis divided into ſeven parts, one of which makes the *Tenia*, whoſe *projecture* is equal to its height. The whole is again divided into 6 parts, one whereof is given to the *Guttæ*, and the *Liſtel*, under the *Tenia*. The *Guttæ* are ſix in number, and the height of the *Liſtel* is a third of the ſaid *Guttæ*. The whole, from the *Tenia* downwards, is again divided into ſeven parts, of which the firſt *fascia* takes three, and the ſecond four.

THE *Frixe* is in height a *module* and a half. The breadth of the *Triglyph* is one *module*: and its *Capitel* takes up the ſixth part of a *module*. The *Triglyph* is divided into ſix parts, two whereof are given to the two *Chanel*s in the middle, and one to the two half *Chanel*s at the extremities: the other three make the ſpaces between the ſaid *Chanel*s. The *Metopa*, that is to ſay, the ſpace between two *Triglyph*s, ought to be perfectly ſquare. The height of the *Cornice* is a *module* and a ſixth, and is divided into five parts and a half: of which two are for the *Cavetto*, with its *Liſtel*, and the *Ovolo*. The *Cavetto* is leſs than the *Ovolo*, by as much as its *Liſtel*. The other three and a half are allow'd for the *Corona*, or *Cornice*, and to the two *Cima*s, the *reverſa* and the *recta*. The *Corona* ought to project two thirds of a *module*, and to have on its *plain* underneath ſix *Guttæ* in length, and three in breadth with their *Liſtels* over the *Triglyph*s, and ſome *Rofes*, or other *Ornaments*, over the *Metopa*. The *Guttæ* are round, and in the ſhape of little *Bells*: thoſe under the *Corona* muſt answer to thoſe under the *Tenia*. The *Cimaſum* ought to be an eighth part larger than the *Corona*, and is divided into eight parts, two whereof are given to the *Liſtel*, and the other ſix to the *Cimaſe*, whoſe *projecture* is ſeven parts and a half. So that, at this rate, the *Architrave*, the *Frixe* and *Cornice*, riſe to the height of the fourth part of the Column: and theſe are the proportions of the *Cornice* according to *Vitruvius*, from whom I have a little receded, by altering ſome Members of it, and making the whole ſomewhat larger.

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| A. <i>Cima recta.</i> | O. <i>Abacus.</i> |
| B. <i>Cima reversa.</i> | P. <i>Ovolo.</i> |
| C. <i>Corona.</i> | Q. <i>Annulets, or Listellas.</i> |
| D. <i>Ovolo.</i> | R. <i>Collar, or Frize of the Capitel.</i> |
| E. <i>Cavetto.</i> | S. <i>Astragal.</i> |
| F. <i>The Capitel of the Triglyph.</i> | T. <i>Listella, or Cinture.</i> |
| G. <i>Triglyph.</i> | V. <i>Body of the Column.</i> |
| H. <i>Metopa.</i> | X. <i>The Plan of the Capitel, and the</i>
<i>Module divided into thirty Minutes,</i>
<i>or parts.</i> |
| I. <i>Tenia.</i> | Y. <i>Soffita, or the underneath of the</i>
<i>Corona.</i> |
| K. <i>Gutta.</i> | |
| L. <i>First Fascia.</i> | |
| M. <i>Second Fascia.</i> | |
| N. <i>Cimafum.</i> | |

C H A P. XVI.

Of the IONICK Order.

THE * *Ionick* Order had its Original in *Ionia*, a Province of *Asia*; and we read that the famous Temple of *Diana* at *Ephesus* was built of that Order. The Column with its *Capitel* and *Base*, is nine *modules* high: and by a *module* is understood, as we have said before, the diameter of the Column below. The *Architrave*, *Frize*, or *Cornice*, have the fifth part of the height of the Column. When the Columns are single, the *Inter-columns* are of two diameters and a fourth part, and this is the most beautiful and commodious manner of all *Inter-columns*, which *Vitruvius* calls *Eustylos*.

† IN the *Arches*, the *pilasters* are in breadth a third part of the space between two of them; and the Arch ought to be in height the double of the said space.

** IF there is to be given a *pedestal* to the Column of the *Ionick* Order, as in any design of *Arches*, it must be made as high, as half the breadth of the opening of the Arch: and having divided it into 7 parts and a half, two of them shall make the *Base* and one the *Cimafum*; the other four and a half remaining shall be for the *Dado*, or *Square* of the *Pedestal*.

THE *Base* of this Order is half a *module* high, and is divided into three parts: one is for the *Orlo*, or *Plinth*; whose *projecture* is the fourth part of its height, and consequently the eighth part of a *module*: the two other parts of the *Base* are subdivided into seven; of three is made the *Torus*; the other four are divided again into two parts, one given to the *Scotia*, or *Cavetto* above, and the other to that below, which ought to have more *projecture* than the other. The *Astragal* must have the eighth part of the *Scotia*. The *Cinture* of the Column, is the third part of the *Torus* of the *Base*; but if the *base* be made a part of the Column, the said *Cinture* may be made smaller, as I have already observ'd in the *Dorick* Order; and the *Cinture* has half of the *projecture* already mentioned. These are the measures of the *Ionick base*, according to *Vitruvius*.

BUT because the *Attick base* is put to this Order in many ancient Buildings, and that it seems to me more agreeable upon a *Pedestal*, I have drawn the *Attick base*

base with a small *Astragal* under the *Cincture*, not omitting, at the same time, to give the Design as *Vitruvius* teaches us.

THE Designs mark'd L. are two different *profils* to make the *Imposts* of *Arches*; and upon each of them the measures are set down by numbers which signify the *minutes*, or parts of a *module*, as I have done in all other Designs. These *Imposts* are in height half as much again, as the thickness of the *pilaster*, which supports the Arch.

A. *Part of the Body of the Column.*

B. *Astragal with its Listella, or Cincture, which are Members of the Column.*

C. *The upper Torus.*

D. *Cavetto, or Scotia.*

E. *The lower Torus.*

F. *The Plinth fastened to the Cimaſum of the pedestal.*

G. *Cimaſum in two forms,*

H. *Dado, or Dye, or Square,* } *of the pedestal.*

I. *Base in two forms,*

K. *Orlo, or Plinth of the base.*

L. *Imposts of the Arches.*

* IN order to make the *Capitel*, the foot of the Column must be divided into 18 parts, and 19 of such parts will be the length and breadth of the *Abacus*, the half of which is given to the height of the *Capitel* with its *Volutas*, whereby it comes to be 9 parts and a half high. One and a half is for the *Abacus* with its *Cimaſum*; the other eight remain to the *Voluta*, which is made in the following manner. From the extremity of the *Cimaſum*, one of the nineteen parts being taken within, from the point where that nineteenth part ends, a line is let fall *plum*, which divides the *Voluta* by the middle, and is call'd the *Carteta*. Where the point falls upon this line, which separates the four parts and a half above, with the three and a half below, there is made the Center of the *Eye* of the *Voluta*, whose diameter is one of the eight parts of its height; and from the said point a line is drawn, which intersecting at right Angles the *Carteta*, divides the *Voluta* into four parts. Next in the *Eye* of this *Voluta* a square is form'd, the bigness whereof is the half diameter of the said *Eye*: and two diagonal lines being drawn in it, upon them are mark'd thirteen points (computing the Center of the *Eye*) which are as many Centers whereon the fixed foot of the Compass is to stand to make the *Voluta*; and as to the order which must be observ'd in them, it appears by the numbers mark'd in the Design. The *Astragal* of the Column is right against the *Eye* of the *Voluta*. The *Volutas* are as thick in the middle, as is the *projecture* of the *Ovolo*, which reaches beyond the *Abacus*, so much as does the *Eye* of the *Voluta*. The hollow, or *Chanel* of the *Voluta* is even with the body of the Column. The *Astragal* of the Column turns about under the *Voluta*, and is always visible, as it appears by the *Plan*: for 'tis natural that so slender a thing as the *Voluta* is feign'd to be, should give way to another stronger, as the *Astragal* is, from which it is always equally distant.

IN the Angles of *Colonnades*, or rows of Columns, and *Porticos* of the *Ionick* Order, *Capitels* are made with their *Volutas*, not only in the front, but also on that part which, making the *Capitel* as usual, would have been the *Flank*; whereupon they come to have the front on two sides, and are called *Angular-Capitels*.

How they are to be made I shall teach in my Book of Temples, i. e. the 4th Book.

- A. Abacus.
- B. Channel, or hollow of the Voluta.
- C. Ovolo.
- D. Astragal under the Echinus or Ovolo.
- E. Cincture, or Annulet, or Listella.
- F. Part of the Body of the Column.
- G. A Line call'd Catheta.

THE Plate XXI. represents the Ionick Base according to Vitruvius, together with the Eye of the Voluta upon a large Scale, marked S.

MEMBERS of the Base according to Vitruvius.

- K. Part of the Body of the Column.
- L. Cincture, or Annulet.
- M. Torus.
- N. First Scotia.
- O. Astragal.
- P. Second Scotia.
- Q. Orlo, or Plinth.
- R. Projecture of the Base.

* THE Architrave, Frieze and Cornice have, as I said before, the fifth part of the height of the Column; and the whole is divided into 12 parts. The Architrave has four, the Frieze three, and the Cornice five. The Architrave is subdivided into five parts; of one is made its Cimafum, and the rest is subdivided again into twelve: for the first Fascia and its Astragal three, to the second and its Astragal four, and to the third five.

THE Cornice is divided into $7\frac{1}{2}$ parts; two are given to the Scotia, or Cavetto and Ovolo; two to the Modillions, and the rest to the Corona and Cimafum. The whole Cornice projects as much as its height.

I HAVE drawn the Front, the Flank, and the Plan of the Capital; and the Architrave, Frieze and Cornice, with their proper Ornaments.

- A. Cimafum, or Cima recta.
- B. Cima reversa.
- C. Corona.
- D. Cimafum of the Modillions.
- E. Modillions.
- F. Ovolo.
- G. Cavetto.
- H. Frieze.
- I. Cimafum of the Architrave.
- K. First Fascia.
- L. Second Fascia.
- M. Third Fascia.

Members of the Capital.

- N. Abacus.
- O. Channel, or hollow of the Voluta.
- P. Ovolo, or Echinus.
- Q. Astragal of the Column.
- R. Part of the Body of the Column.

The *Plan* mark'd S, represents the *Soffite*, or the underneath of the *Corona* between each *Modillion*.

C H A P. XVII.

Of the CORINTHIAN Order.

* **A**T *Corinth*, a most famous City of *Peloponnesus*, now the *Morea*, was invented the Order from thence call'd *Corinthian*, and which is more genteel, rich, and beautiful, than any of those I have yet discours'd upon. The Columns are like those of the *Ionick Order*; and, with the *Base* and *Capitel*, they are nine *Modules* and a half high. If they are *fluted* they must have 24 *Flutes* or *Channels*, which are to be half as deep as they are broad. The *Plans*, or *Spaces*, between one *Flute* and the other, must be a third part of the breadth of the said *Flutes*. The *Architrave*, *Frize*, and *Cornice*, are a fifth part of the height of the Columns. In the design of a *Colonnade*, or single Columns, the *Inter-columns* are two diameters, as in the *Portico* of *St. Maria Ro'unda* at *Rome*; and this manner of *distancing* the Column is, by *Vitruvius*, call'd *Syzylos*.

† IN that of *Arches*, the *Pilasters* have two fifths of the breadth of the *Arch*, which breadth or void is in height two squares and a half, the thickness of the said *Arch* being comprehended.

** THE *Pedestal* under the *Corinthian Column*, must have in height the fourth part of the length of the Column, and being divided into eight parts, one is given to the *Cimassum*, two to the *Base*, and five to the *Dye* or *Square*. The *Base* must be divided into three parts, two for the *Zocco* or *Plinth*; and one to the *Moulding*.

THE common *Base* of this Column is the *Attick*; but yet it differs from that which is put to the *Dorick Order*; for in this the *projecture* is the fifth part of the diameter of the Column; whereas in the *Dorick* it is the sixth part. It may also vary in some other parts, as it appears by the Design, where I have profil'd the *Imposts* of the *Arches*, the height of which is double of the *Membretto*, or *Half-pilaster* which bears up the *Arch*.

A. Part of the Column.

B. *Cincture*, or *Astragal* of the Column.

C. *Upper Torus*.

D. *Cavetto*, or *Scotia*, with its *Astragals*.

E. *Lower Torus*.

F. *Orlo*, or *Plinth* of the *Base*, join'd to the *Cimassum* of the *Pedestal*.

G. *Cimassum*,

H. *Dado*, or *Dye*, or *Square*,

I. *Moulding* of the *Base*,

K. *Orlo*, or *Plinth* of the *Base*,

L. The *Impost* of the *Arch*.

} of the *Pedestal*.

†† THE height of the *Corinthian Capitel* takes a diameter of the Column below, and a sixth part more, which is allow'd to the *Abacus*. The rest is divided into three equal parts. One is for the lowermost row of *Leaves*, the other for the middle row; but the third is subdivided into two, and of that part next to

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the

* Plate XXIII. † Plate XXIV. ** Plate XXV. †† Plate XXVI.

* The Stock or Stem taken from Colewort, is a plain mistake: for all such Leaves at their Stalk are stronger, but not broader than in the midst; as those of the *Cauliculi*, in the *Corinthian* Capital: It is not a Stalk only with the Leaves stript off, but a Tencil; and he means from the side of the Square of the Abaco, which is all one, as from the *Roses* straight Leaves, and not as *Vignola* has made them. But the *Roses* of *Palladio* have too little Projection, as the other have too much. Between them both, *Scamozzi's* is the best, which he makes a Circle of one diameter and $\frac{1}{2}$, and the Lines are to touch the *Astragal*. This Rule I have used myself, and it does well. *Viola Zanini* follows *Palladio* directly.

The *Abacus* are made the *Cauliculi*, or *Stalks*, with their *Leaves*, which seem to be supported by them; and therefore the *Stalk* from whence they grow, must be made thick, but they in their *foldings* must diminish by degrees; following in that the Example of the Plants, which are thicker at the bottom than at the extremities of their Branches*. The *Bell* which is the inward body of the *Capital* under the *Leaves*, ought to be *plum* with the bottom of the *Flutes* of the Column. To give the *Abacus* a convenient *projecture*, a perfect square must be made, each side whereof is to be a *module* and a half, and the diagonal lines being drawn from one angle of it to another, the point of their intersection in the middle, is the center of the said square; on which the fix'd foot of the Compass being plac'd, towards each Angle of the square a *module* must be mark'd, where lines must be drawn intersecting at right Angles with the said diagonal Lines, that they may touch the sides of the square. These are the bounds of the *projecture* of the *Abacus*, the length of the said Lines, giving the breadth of its *Horns*. The *Curvilineal-side*, or diminution of the *Abacus* is made, by drawing a circular line from one horn to the other, which will be the *Base* of an *equilateral* triangle. Then a strait line is drawn from the extremities of the said horns to the extremities of the *Astragal* of the Column, which Line the *Tongues* of the *Leaves* must seem to touch, or rather pass a little outwards, and so they have a full *projecture*. The *Rose* is to be as broad as the fourth part of the diameter of the Column at the foot. The *Architrave*, *Frize* and *Cornice* (as I have said before) are to be a fifth part of the height of the Column, and the whole is to be divided into 12 parts, as in the *Ionick* Column: with this difference however, that the *Cornice* of the *Corinthian* is divided into eight parts and a half, one of which is given to the *Cima reversa*, and another to the *Denticuli*, the third to the *Ovolo*, the fourth and fifth to the *Modillions*, and the other three and a half to the *Corona* and *Cima*. The *Cornice* has as much *projecture* as it has height. The *Pannels* of the *Roses*, between the *Modillions*, must be square; and the *Modillions* as big as half the *Plan* of the said *Roses*. The Members of this Order have not been mark'd with Letters, as the foregoing, because by them these may be easily understood.

C H A P. XVIII.

Of the COMPOSITE Order.

* THE *Composite* Order (which is also named *Roman*, as being an Invention of the ancient *Romans*) is so call'd, because it partakes of all the aforesaid Orders; and the most regular and beautiful is that which is compounded of the *Ionick* and *Corinthian*. It is more slender than the *Corinthian*, and may be made like it in all its parts, except in the *Capital*.

THE Columns ought to be 10 *Modules* high. In the Designs of Columns, or single *Collonades*, the *Inter columns* are but of one diameter and a half: and in this manner is call'd by *Vitruvius*, *Picnostylos*.

† IN those of *Arches*, the *pilasters* are to be half of the breadth, or void of the *Arch*, which is to be under the *Keystone* two *squares* and a half high; that is to say, two diameters and a half of the *Arch*.

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* AND

* Plate XXVII.

† Plate XXVIII.

* AND because (as I have said) this Order is more slender than the *Corinthian*, its *Pedestal* must be the third part of the height of the Column; which being divided into eight parts and a half, of one part is made the *Cima-sum* of the said *Base*, five and a half for the *Dado*; the two others for the *Base*, which being subdivided into three, two will make the *Zocco*, or *Plinth*; and the third for the *Torus* and *Cima*.

THE *Base* of the Column may be made *Attick*, as in the *Corinthian*; and it may be also compounded of the *Attick* and the *Ionick*, as appears by the Design.

THE *Imposts* of the Arches are profil'd by the side of the *Pedestal*; and its height is equal to the diameter of the *Membretto*, or *Half-pilaster*.

A. *Impost of the Arch.*

† THE *Capitel* of the *Composite* Order has the same measures as that of the *Corinthian*; but it differs from it in the *Voluta*, *Ovolo*, and *Fusarolo*, or *Fuse*, which are Members of the *Ionick* *Capitel*. The way of making it is thus. From the *Abacus* downward, the *Capitel* is divided into three parts, as in the *Corinthian*. The first is given to the first row of *Leaves*, the second and the third to the *Voluta*, which is made in the same manner, and with the same points as that of the *Ionick*. It takes up so much of the *Abacus*, that it seems to go out of the *Ovolo*, at the foot of the *Flower* which is put in the middle of the circular side of the *Abacus*; and it is as thick in the front, as the breadth of the *Horns* thereof, and a little more. The *Ovolo* is as big as three parts of five of the *Abacus*, and its lower part, that is its *Fuse*, ought to be parallel with the *Eye* of the *Voluta*. It has in its *projecture* $\frac{1}{4}$ of its height, and is with its *projecture*, perpendicular to the hollow of the *Abacus*, or a little more outwards. The *Fuse* is a third part of the height of the *Ovolo*, and has in its *projecture* something more than the half of its thickness. It turns about the *Capitel* under the *Voluta*, and is always seen. The *Listel*, which is under the *Fuse*, and makes the edges of the *Bell* of the *Capitel*, is the half of the *Fuse*. The body of the *Bell* ought to be *plum* with the bottom of the *Flutes* of the Column. I have seen one of this sort at *Rome*, from which I have drawn all these measures, because it appear'd to me very beautiful and well contriv'd.

THERE are *Capitals* to be seen made after another manner, and which may be call'd *Composite*; of which I propose to speak, and to insert the Designs of them in my Book of *Antiquities*. The *Architrave*, *Frize*, and *Cornice*, have the fifth part of the height of the Column; and it will be very easy to know their different division, or distribution, by that which has been said before in the other Orders, and by the Numbers I have plac'd in the Designs.

CHAP. XIX.

OF PEDESTALS.

HITHERTO I have discours'd, as much as to me seem'd necessary to be known, concerning simple Walls and their Ornaments; and in particular I have touch'd upon the *Pedestals*, which may be applied to every Order. But because it appears that the Ancients have not had this regard to make the *Pedestals*

* I late XXIX.

† Plate XXX.

pedestals bigger for one Order than for another, altho' this part much adds to the beauty and ornament of the work, when it is made with discretion and due proportion to the other parts: to the end nevertheless, that the Architects may get a full knowledge of these, and make a right use of them upon occasion, they must take notice that the Ancients made them sometimes square, that is to say as long as broad, as may be seen in the *Arch* call'd *di Lioni* at *Verona*; and these I have assign'd to the *Dorick* Order, because it requires more solidity. Sometimes they took their measure in making of them from the diameter of the void of the *Arch*, as in the *Arch* of *Titus* at *Sancta Maria Nova* at *Rome*, and that of *Trajan* over the Gate of *Ancona*, where the *Pedestal* is half the height of the opening of the *Arch*; and of this kind of *Pedestals* I have put to the *Ionick* Order. Sometimes they took their measure from the height of the Column, as is seen at *Susa*, a City situated at the foot of the Mountains which divide *Italy* from *France*, in an *Arch* erected to the honour of *Augustus Caesar*: and in the *Arch* of *Pola*, a City of *Dalmatia*, and also in the Amphitheatre of *Rome* in the *Ionick* and *Corinthian* Orders: in which Buildings the *Pedestal* is the fourth part of the height of the Column, as I have made it in the *Corinthian* Order. In *Verona*, in the *Arch* call'd *di Castel vecchio*, which is very beautiful, the *Pedestal* is a third of the height of the Column, as I have order'd it in the *Composite* Order. All these forms of *Pedestals* are most beautiful, and have most elegant proportions with the other parts to which they belong. And when *Vitruvius* discoursing of Theatres, makes mention of the *Poggio*, one must know, that by that word he means the *Pedestal* to which he gives the third part of the Columns with which he adorns the Scenes. But of *Pedestals* which exceed a third part of the Column, we have an Example at *Rome* in the *Arch* of *Constantine*, where the *Pedestals* have one of two parts and a half of the height of the Column. And almost in all the ancient *Pedestals* 'tis to be observ'd, that the Bases have the double of the *Cima-sum*, as I shall demonstrate in my Book of *Arches*.

C H A P. XX.

Of the Errors and Abuses introduced into Architecture.

HAVING set down all those Ornaments of *Architecture* which consist in the right use of the five Orders, and having shewn how they ought to be made by drawing the *Profils* of each of their parts, according as I found that the Ancients did practise; it seems to me not unfit here, to inform the Reader of many Abuses, which having been formerly introduc'd by *Barbarians*, are observ'd even to this day; and this I do, to the end that the Studios in this Art may avoid them in their own Works, and be able to take notice of them in those of others. I say then, that *Architecture* (as all the other Arts) being grounded upon Rules taken from the imitation of Nature, admits of nothing that is contrary, or foreign to that Order which Nature has prescrib'd to all things. Wherefore we see that the ancient Architects, who begun to alter their Timber-Buildings, and to make them with Stones, kept their Columns less at the top than at the foot, taking example from Trees, all which are less at the top than in the Trunk, and towards the Roots: likewise, because it is very natural that those things upon which any great weight is laid, should be pres'd,

under

under the Column they did put a *Base*, which by its *Torus*, *Cavetto*, and *Astragal*, seems to represent a swelling caus'd by the burden over it. So they brought in the *Cornices*, *Triglyphs*, *Modillions*, and *Dentils*, to represent the heads of the *Joysts*, which in the *Cieling* are plac'd to bear up the *Roof*. The same may be observ'd in all other parts, if one is curious to examine them. And this being so, what shall we say of that form of Building, which is so contrary to what Nature has taught us, that it deviates from that Simplicity which is visible in things by her produc'd, and departs from all that is good, or true, or agreeable in the way of Building: for which reason, instead of Columns, or Pilasters, which are contriv'd to bear a great weight, one ought not to place those Modern Ornaments call'd *Cartooshes*, which are certain *Scrolls* that are but an eye-fore to the Artists, and give others only a confused Idea of *Architecture*, without any pleasure or satisfaction; nor indeed do they produce any other effect than to increase the Expences of the Builder. For the same reason these *Cartooshes* ought never to come out of the *Cornice*; for it is requisite that all the Members of it should be made to some end, and to shew what it would be, if all the work had been fram'd of Timber. Besides that, as it is requisite to uphold a great weight with something solid, and fit to support it: so such non-sensical things, as *Cartooshes*, are altogether superfluous, because it is impossible that the *Joysts*, or any other Timber whatsoever, could really perform what these represent; and since they are feign'd to be soft and weak, I know not by what Rule they can be put under any thing heavy and hard. But of all Abuses, in my opinion the most intolerable is, the making certain frontons of Doors, or Windows, or Galleries, divided in the middle: because these frontons were contriv'd at first to defend those parts from Rain, necessity having taught our first Architects to give them the form of a *Roof*; so that I know nothing more contrary to natural Reason, than to divide and open that part which the Ancients did make whole, in order to defend the Inhabitants of the House, and those that enter into the same, from Rain, Snow, Hail, and other injuries of the Air: and altho' variety and novelty should please all, yet we are not to go against the precepts of Art, and that which Reason demonstrates; whence we see that the Ancients in their several Contrivances have never departed from the general and necessary Rules of Art or Nature, as may be seen in my Book of *Antiquities*. As for the *projecture* of the *Cornice*, and other Ornaments, 'tis not a small abuse to make it too great; because when these Projectures exceed their just measure, especially if the Building is in a close place, it appears the narrower and more uncomely, as well as always frightening those which stand underneath, as if it would fall upon them. One ought also carefully to avoid making the *Cornice* disproportionable to the Columns; for 'tis certain that putting great *Cornices* upon little Columns, or upon great Columns little *Cornices*, must needs make a very sad Aspect. Again, those sorts of Columns, which are feign'd to be made of several pieces, and jointed together by the means of certain *Rings*, or *Annulets*, in the form of a Rustick, ought also to be no less carefully avoided; because how much the more entire and strong the Columns appear, so much the more they perform the design for which they are plac'd, which is to render the Work above more secure and firm. Many other the like abuses might be reckon'd up, as of some Members which in the *Cornices* are made disproportionable to the rest, as by what I have shewn before, and by what is now said, may be easily known. It remains now to come to the disposing of the particular and principal parts of a Building.

C H A P. XXI.

Of Galleries, Entries, Halls, Anti-Chambers, Chambers, and of their several proportions.

GALLERIES are commonly made in the fore or back Front of a House; or if only one is intended, it must be in the middle: if two, they are to be plac'd in the Wings. They serve for many uses, as walking eating and other diversions. They are made larger or lesser, according to the greatness and convenience of the Building; but ordinarily they ought not to have less than 10, nor more than 20 Foot in breadth. Besides this, every well-order'd House ought to have in the middle, or chief part, some place with which all the other parts of the House may have an easy Communication. Those places in the Ground-Story are vulgarly call'd *Entries, Lobbies, or Passages*; and above they are *Halls*. They serve in a House as publick places. The Entries serve for those who attend, or wait on the Master to salute him, or to do any business with him. Such places are the parts of the House, (besides the Galleries) that first present themselves to those that are about to enter the same. The Halls serve for all sorts of ceremonial Feasts, as Weddings, Banquets, Comedies and such other Pastimes. For this reason, therefore, these places ought to be made much more spacious than others, to the end that many Persons may commodiously be entertain'd therein, and easily see what's a doing. I do observe always to allow for the length of a Hall, no more than the double of its breadth; but the nearer they come to a Square, the more beautiful and convenient they will be.

THE Anti-Chambers and Chambers ought to be so divided and disposed, that they may fall on each side of the Entry and of the Hall, taking care that those on the right hand may exactly answer to those on the left; that so not only one side of the Building be in all things equal to the other, but that the Walls likewise may bear equally the Burden of the Roof: because if the Chambers were on one side larger than on the other, this (considering the closeness of the Walls) would bear more of the weight; and the other, being proportionably weaker, would occasion many inconveniencies, and in process of time the ruin of the whole Fabrick.

THE handsomest and most elegant proportion for Chambers, and which have the best effect, may be taken seven different ways: for they may be made round (which form is very little in use) or square, or they have in length the Diagonal of their square, or a third more than the square, or a square and a half, or a square and two thirds, or two squares full.

C H A P. XXII.

Of F L O O R S and C I E L I N G S.

AFTER having spoken of the forms of Galleries, Halls, Anti-Chambers, and Chambers, 'tis necessary to say something of Floors and flat Cielings. The superficies of the Floors may be made out of Mortar, as usual in *Venice*, or of square Tiles, or of hard Stone. Those of Mortar or Plaster are very good, when made out of beaten *Cement* and fine Sand, or with River-Pebbles, or *Padoua* Stone-lime; all well mixt together. Such Floors must be made during the Spring, or Summer, that they may dry the better. Brick, or Square Tile-Pavements are more agreeable to the Eye, because of the many forms into which they may be made, and of the Colours they are capable to receive by the divers colours of the Earth they are made with. The Floors of Bed-chambers, or other much frequented Rooms, are seldom made of Marble, or any hard Stone, because in the Winter they would be too cold; but in Galleries, or other publick places, they will agree well enough.

CARE must be taken, that all the Rooms which are of the same Story, may have their Floor or Pavement equal, and in such a manner that the very Thresholds of the Doors may not be higher than the rest. And if any little Room or Closet should happen to be lower than the rest, what is wanting must be supplied by a *Mezanine*, or false Floor-Cieling.

THE Cielings are also made divers ways, for some delight to have handsome and well wrought Joyfts; in which case it is necessary to observe, that the Joyfts be distant one from another the thickness of a Joyft and a half: because such a distribution will make the Cieling very handsome, and between the ends of every Joyft, there will be sufficient Wall to bear the upper Story: whereas if they should stand wider one from the other, it would look ill, and if closer, 'twould be like a dividing of the upper Wall from the lower; and the Joyfts rotting at the end, or being consum'd by Fire, the Wall above must fall of course. Others will have Compartements of *Stuc* (*which is a sort of hard Plaster*) or of Planks, that they may enrich them with Pictures, beautifying them according to their various Humours and Fancies; and therefore in this point there can be given no determinate Rules.

C H A P. XXIII.

Of the Height of CHAMBERS.

CHAMBERS are made either arch'd, or with a flat Cieling. If the last way, the height from the Pavement or Floor to the Joyfts above, ought to be equal to their breadth: and the Chambers of the second Story must be a sixth part less than them in height. As to the Rooms which are arch'd (and which are commonly made so in the first Story, not only because they are more beautiful, but also less subject to Fire) their height in a square Room is a third more than their breadth: but in those whose length exceeds their breadth, a
height

height proportional to the length and breadth together may be easily found, by joining both the two Lines of the length and breadth into one Line, which being divided by the middle, the one half will give exactly the height of the *Arch*. As for Example, let BC be the place where an arch'd Room is to be made; joining the breadth AC with the length AB, and the line EB being divided into two equal parts in the point F, 'tis plain that FB is the height requir'd. Or if the Room to be arch'd is 12 Foot long, by 6 wide, these two numbers join'd together, give 18, the half of which is 9, and therefore the height of such a Room must be 9 Foot.

ANOTHER proportional height to the length and breadth of a Room, may be found in this manner. BC being the Room to be arch'd, the length and breadth shall be join'd upon one Line as BF; on the middle of which having mark'd the point C, it will be the Center of the Semi-circle BGF, and in prolonging the Line AC till it touches the Circumference at the point G, the Line AG will be the height of the Arch BC. That same proportion is to be found by numbers in this manner: knowing how many Foot are contain'd in the length and breadth of the Room, we must find a number which has the same relation of proportion with the breadth, as the length has with it, by multiplying the less extreme by the greatest; because the *Square Root* of the product of that multiplication shall be the height demanded. As for Example, if the place to be arch'd is 9 Foot long and 4 Foot wide, the height of the Arch shall be 6 Foot, for the proportion from 9 to 6, is the same as from 6 to 4, viz. the *sesquialteral* proportion, but it must be observ'd that this height is not always to be found by numbers.

THERE is another height to be found, which tho' less, has notwithstanding a very good proportion with the length and breadth of the Room. Having drawn the Lines AB, AC, CD, and DB, which represent the breadth and length of the Room, and the height taken according to the first method, which is CE being join'd to AC; draw the Line EDF, then prolonging the Line AB till it touches the Line EDF, in the Point F, the Line BF shall be the height of the Arch. But to find it by numbers is thus: Having taken the length and breadth of the Room according to the first method, which height is in the foregoing Example 9 Foot; put together the length, the breadth and the height, as this Figure represents, then multiply the 9 by 12, and the 6, and the product of the 12 being set under the 12, and that of the 6 under the 6; 12 9 6 multiply 6 by 12, lay the product under the 9, which will make 108, 72, 54 72, and having got a number which being multiplied by 9, produces 72, as 8 would do in this Example; I say that the Arch is to be 8 Foot high. These different heights have such a relation amongst themselves, that the first is larger than the second, in the same proportion with which the second is larger than the third. We may then make use of each of these heights, according as they will allow more conveniency in contriving, that the several Rooms of different dimensions may have their *Arches* equally high, and yet with a just proportion. By these means the Rooms will have an agreeable Aspect, and the Floor above will be upon a level, and very commodious. There are other proportions for the height of *Arches*, which have no determinate Rules: and so they must be left to the Architect to make use of them, according to his Judgment, and as he sees necessary.

C H A P. XXIV.

Of the divers sorts of ARCHES.

THERE are six different forms of *Arches*, viz. *cross'd, fasciated, flat*, (those are call'd so, which are but a Section of a Circle) *round, grinded, and shell-like*, all which have in height one third of the breadth of the Room. The two last are but of a modern Invention, but the other four were used by the Ancients. Round *Arches* are fit for square Rooms: and the way to make them, is to leave in the four Angles some sort of *Mutules, Carsoofbas, Consoles, or any other shouldering-pieces*, to bear the *Arch*, which in the middle happens to be flat, but more round, as it comes nearer the Angles. Such a one is at *Rome* in the Bath of *Titus*, which was almost ruined when I saw it. I have drawn here* the form of each sort of *Arching*, appropriated to the figure of the Rooms that are fit for the same.

C H A P. XXV.

Of the Measures of DOORS and WINDOWS.

IT is not possible to give any certain and determinate Rule for the height and breadth of the principal Gates, or Doors of Buildings, nor of the Doors and Windows of Rooms; because, that, for to make the principal Gates, the Architect must accommodate them to the extent of the Edifice, the quality of the Master, and the use that is to be made of them, by what goes in, or out of the same. The following method seems to me to succeed well enough: that is, to divide all the height from the Ground to the first Cieling above into three parts and a half (as *Vitruvius* mentions in his 4th Book, Chap. 6.) and to give two of those parts to the height of the opening, and one to its breadth, wanting a 12th of the height. The Ancients were wont to make their Doors narrower above than below, as may be seen in a Temple at *Tivoli*; and *Vitruvius* teaches the same, perhaps for procuring a greater solidity. The great Doors ought to be placed in such a manner, that there may be a free coming to them from all parts of the House. Doors within the House ought not to exceed three Foot in breadth, nor six and a half in height: nor can they be less than five Foot high by two wide. As for the openings of the Windows, one must consider how to place them so that the Rooms should not receive too much nor too little Light; and that the Windows themselves be not too close, nor at too great distance one from another. Therefore in ordering of them the dimensions of the Rooms are to be consider'd, because it is plain that a large Room wants more Light than a little one; and if Windows are made less in number and smaller than the Building requires, the Rooms will be dark: as on the contrary, if they exceed both in number and largeness of the opening, they'll render the Rooms uninhabitable, because of the Air which will bring in, according to the seasons, too much cold, or too much heat; except they are situated to a temperate exposition of the Sun. For

these Reasons, the breadth of the opening of the Window ought not to exceed the fourth part of that of the Rooms, nor to be less than the fifth: they must likewise have in height two Squares and a twelfth part. And because a House is made of several Rooms, some of a large, some of a small, and some of a middle size; and that nevertheless all the Windows of the same Story are to be equal, I chuse to take the measure of them on the dimension of those Rooms whose length is two thirds more than the breadth, that is, as 10 Foot are to 30: and I divide that breadth into 4 parts and a half, one of which serves for the breadth of the opening of the Windows, giving to the height two of the said parts, with a sixth of the breadth, and I keep the same proportion of all the other Windows. Those of the second Story ought to be lower by a sixth part than those of the first; and if there be some others above them (as in a third Story) they must follow the same diminution. One must take great care also, that the Windows may be equal one with the other in their rank and order; so that those on the right hand may answer those on the left, and those above may be plac'd right over those below. Likewise, the Doors must be exactly over one another, to the end that the void may be upon the void, and the solid upon the solid. Moreover, they require to be upon the same Line, that one may see through from one end of the House to the other, which is very beautiful and cool in the Summer, and has many conveniencies besides.

For solidity's sake certain *Arches* are turn'd over the Cornices of Doors and Windows, which Workmen call *Flat-Arches*, to prevent the Doors and Windows from being press'd with too much weight, which is of no little importance for the lasting of the Building. The Windows must be distant from the Corners of the Building as much as possible, as I have observ'd before; because that part whose Office is to support, bind, and fasten all the rest of the Fabrick, ought not to be open and weaken'd. The Pilasters, Jambs, or Cheeks of Doors and Windows are not to be thicker than the fifth part of the breadth of the opening, nor less than the sixth. It remains to see their Ornaments.

C H A P. XXVI.

Of the Ornaments of DOORS and WINDOWS.

HOW to enrich and adorn the principal Doors in Buildings, may easily be known from what *Vitruvius* teaches in the 6th Chapter of his 4th Book, with the help of the explanation and draughts made by the most Reverend *Barbaro* upon that Subject, together with what I have said and design'd already about the five Orders: wherefore leaving these things, I shall only give here some Ornaments of the Doors and Windows of Chambers, in the manner that they may be variously made; and will also shew the method of profiling each Member with grace, and its due *Proportion*. The Ornaments which are given to Doors and Windows, are the *Architrave*, *Frize*, and *Cornice*. The *Architrave* turns about the Door, and ought to be as thick as its *Jambs*, or *Pilasters*: which (as I have said) must not be less than the sixth part of the breadth of the opening, nor more than a fifth. The dimensions of the *Frize* and *Cornice* are also taken from the same opening. Of the two following inventions the first, that is the uppermost, is measur'd thus.

* THE

* THE Architrave (which is suppos'd here to be the sixth part of the breadth of the opening) is divided into four equal parts, three of which are allow'd for the *Frieze*: and five, like them, will make the *Cornice*. The *Architrave* is again divided into ten parts, the first *Fascia* takes up three, the second four; and the three remaining are subdivided into five, two of which are for the *Regula*, or *Lisfel*, the three others for the *Cima reversa*: its *Projecture* is equal to its height; the *Regula* projects less than half of its thickness. The *Cima reversa* is made in the following manner: a strait Line being drawn from the underneath of the *Regula* to the upper part of the second *Fascia*, that Line is divided into two parts, so as each of these halves is the *Base* of a Triangle *Isoscel*, that is of two equal sides; and on the Angles oppos'd to these *Bases* the fix'd foot of the Compass being plac'd, and the *Curve Lines* drawn, they'll form the said *Cima reversa*.

THE *Frieze*, which takes up three parts of the *Architrave* divided into four, is made the *Convex* of a portion of a *Circle* less than the *Semicircle*; its largest diameter falling *plum* over the *Cimafum* of the *Architrave*. The five parts allow'd for the *Cornice*, are distributed to its Members in this manner; one is given to the *Cavetto* with its *Lisfel* (which is a fifth part of the said *Cavetto*) the projecture of which *Cavetto* is two thirds of its height. To design it, one must form a Triangle *Isoscel*, the center of which is (as here) the Angle C; so that the *Cavetto* becomes the *Base* of the Triangle. Another of the said five parts is given to the *Ovolo*. The projecture of it is also the two thirds of its height, and is likewise form'd by the help of an *Isoscel* triangle, its Center being at the point H. The other three parts of the five, are subdivided into 17; eight for the *Corona* with its *Lisfels*, of which that above makes one of the eight parts; and that which is below, and makes the hollow of the *Corona*, has but a sixth part of the *Ovolo*. The other nine are for the *Cima recta* and its *Regula*, which is a third of the said *Cima*. But to make the said *Cima* of an elegant form and justness, the strait line AB is drawn, and divided into two equal parts at the point C; one of these two parts is subdivided into seven, whereof six being taken at the point D, one must draw the two Triangles AEC, and CBF: then on the points E and F a foot of the Compass being fix'd, the portions of the *Circles* AC, and CB, will form the said *Cima recta*.

THE *Architrave* of the second invention (which is the lowermost) is likewise divided into four parts, three of which are given to the height of the *Frieze*, and five like them to the *Cornice*. The *Architrave* is again divided into three parts, two of which being subdivided into seven, three are for the lower *Fascia*, and four for the other. The third part of the *Architrave* is divided into nine parts, of two whereof is made the *Astragal*, and the seven remaining, being subdivided into five, three are for the *Cima reversa*, and two for the *Orlo*, or *Regula*.

THE height of the *Cornice* is divided into five parts and three quarters. One of which being subdivided into six parts, five are given to the *Cima reversa* above the *Frieze*, and the sixth for its *Lisfel*; the *Projecture* of the said *Cima* is equal to its height, as is that of the *Lisfel*. The *Ovolo* takes the second part of the height of the *Cornice*, and its *Projecture* is three quarters of its height; the *Lisfel* above the *Ovolo* is a sixth of it, and projects just as much. The other three parts of the height of the *Cornice* are subdivided into 17, eight of which are for the *Corona*, whose projecture is one third more than its height. The other nine are subdivided into four parts; three are for the *Cima recta*, and one for the *Orlo* or *Lisbella*.

The three quarters remaining are subdivided into five parts and a half; of one is made the *Lifella*, and the four and a half for the *Cima reversa* above the *Corona*. The projecture of this *Cornice* is equal to its thickness, or height. By the means of the two following Designs, one may know the Members of the second invention.

Members of the *Cornice* of the first invention.

- I. *Cavetto*.
- K. *Ovolo*.
- L. *Corona*.
- N. *Cima recta*.
- O. *Orlo*, or *Lifella*.

Members of the *Architrave*.

- P. *Cima reversa*.
- Q. First *Fascia*.
- V. Second *Fascia*.
- R. *Orlo*, or *Lifella*.
- S. *Convexity*, or swelling of the *Frize*.
- T. Part of the *Frize* which enters into the *Wall*.

* OF these two other inventions following, the *Architrave* of the first mark'd F, is likewise divided into four equal parts, three and a quarter of which make the height of the *Frize*, and five like them is the height of the *Cornice*. The *Architrave*, being divided into eight parts, five are given to the *Plain*, and three to the *Cimafum*; which *Cimafum* is subdivided into eight, three for the *Cima reversa*, three for the *Cavetto*, and two for the *Orlo* or *Regula*. The height of the *Cornice* is divided into six parts, two are for the *Cima recta* with its *Orlo* or *Regula*, and one for the *Cima reversa* with its *Lifella*. The *Cima recta* is divided into nine, eight of which are for the *Corona* with its *Lifella*. The *Astragal*, or *Tondino*, above the *Frize*, is but a third of one of the said six parts; and what remains between the *Corona* and the *Astragal*, is left for the *Cavetto*.

IN the next Invention the *Architrave* mark'd H, is divided into four parts: the *Frize* is as high as three and a half of them, and the *Cornice* as five. The *Architrave* being again divided into eight, the *Fascia* takes five, and the three others are for the *Cimafum*: which *Cimafum* being subdivided into seven, whereof the *Astragal* takes one; the six are again subdivided into eight, three of which are for the *Cima reversa*, three for the *Cavetto*, and two for the *Orlo*, or *Regula*.

THE whole height of the *Cornice* is divided into six parts and three quarters. The *Cima reversa*, *Ovolo*, and *Dentilli* take three. The *Cima* projects as much as its square, the *Dentilli* project as much as two of three parts of their height, and the *Ovolo* as three of four parts. The *Cima reversa*, between the *Cima recta* and the *Corona*, is made of the three quarters of a part of the first division. The three remaining parts are subdivided into 17. Nine of which are for the great *Cima* with its *Orlo*, or *Regula*; and eight for the *Corona*. This *Cornice's* Projecture is equal to its height, or thickness, as the other aforesaid.

* Plate XXXVI.

C H A P. XXVII.

Of CHIMNEYS.

THE Ancients used to heat their Chambers in this manner. They made their Chimneys in the middle of the Room, with Columns, or *Modillions* to bear up the *Architrave*, upon which were the *Funnels* of the Chimneys made in a Pyramidal form, which convey'd away the Smoak. Of that kind one may be seen at *Baiæ* near the Fish-pond of *Nero*; and another near *Civita-vecchia*. And when they did not care to have any Chimney, they used to make *Pipes*, or *Funnels*, in the thickness of the Walls, through which ascended the heat of the fire which was kept under the Rooms, and so was convey'd thro' certain *Vents*, or *Valves* that were at the top of the said *Pipes*, or *Funnels*. Much like this the Gentlemen of the Family of *Trenti* in the *Vicentin* refresh in the Summer the Chambers of their *Villa* at *Cosfoza*. For that Building is situated upon Hills, in which are certain great *Caves*, call'd by the Inhabitants *Covali*, which in former times were Quarries. These, I suppose, *Vitruvius* means in his second Book, wherein, speaking of Stones, he tells us that in the *Trevisan* there is a sort of Stone which is saw'd like Timber. From these *Caves* arise extreme cold Winds, which these Gentlemen introduce into their House, through certain subterranean Vaults, named by them *Ventiducts*: and by the means of certain *Pipes* or *Funnels*, like to those whereof I have spoken before, they make them run through all the Chambers, opening and shutting them at pleasure, to take more or less of that cold Air, according to the Season. And though this place would be wonderful, were it only for this singular conveniency, nevertheless that which renders it still more admirable and worthy to be seen, is another place call'd the *Prison of the Winds*; which is a subterranean Room contriv'd by Signior *Francisco di Trenti*, named by him *Æolia*, that is, the Palace of *Æolus*, in which many of these *Wind-Pipes*, or *Ventiducts*, are discharg'd: and to render it beautiful and worthy of this name, he has spared neither pains, nor costs of any sort. But to return to our Chimneys, we *Moderns* place the *Funnels* of the Chimneys in the thickness of the Walls, and carry them quite through the Roof, and higher than the *ridge*, that they may the better carry the Smoak away into the Air. One must take care that the *Funnels* be made neither too wide, nor too narrow: for if they be too wide, the Wind having a great deal of room to play in, will drive back the Smoak into the Room; and if they are too narrow, the Smoak, not having a free Passage, will also return backwards. Therefore the Chimney *Funnels* of Chambers are not to be made narrower than half a Foot, nor larger than nine Inches; and in length two Foot and a half. The mouth of the *Pyramide*, where it meets the *Funnel*, must be a little narrower, that in case the Smoak happens to come back, it should put a stop to its returning into the Room. Some make the *Funnels* crooked, thinking that by the winding of them, and the force of the Fire, which naturally drives the Smoak upward, it can't return back into the Room. The Chimney-tops, or openings by which the Smoak goes out, must be broader, and free from any combustible matter. The *Jambs* and *Mantle-Trees* of Chimneys, on which the *Funnels* lie, must be curiously wrought; for as to *Rustick-work*, it does not look well, unless it be in a very large Building, for the Reasons aforementioned.

C H A P. XXVIII.

Of Stair-cafes, and their different sorts; of the number and proportions of their Steps.

THERE ought to be great care taken in the well-placing of Stair-cafes; for there is not little difficulty to find a place convenient enough, so as the Stairs may not be a hindrance to the rest of the Building. Therefore a particular place must be mark'd out, that no part of the Building should receive any prejudice by them. There are three openings necessary to a Stair-cafe. The first is the Door-way that leads to them, which the more it is in sight, the better it is; and I highly approve that it be in such a place, where before one comes to it, may be seen the best part of the House; for altho' the House should be little, yet at this rate it will appear much larger: therefore the said Door must be obvious, and easy to be found.

THE second opening is that of the Windows, through which the Light comes into the Stairs. They ought to be in the middle, and large enough that all the Stairs may be every where enlighten'd. The third opening is the Landing-place, by which one enters into the Rooms above, which ought to lead first into the largest places, fair and well adorn'd.

STAIR-CASES will be perfect, if they are spacious, light and easy to ascend: as if, in some sort, they seem'd to invite People to mount. To make them light-some, they must have a perfect Light, that, as I said, disperses it self equally to all parts. As to their spaciousness, 'twill be enough, if in respect of the bigness and quality of the Fabrick, they do not appear too little, nor too narrow. Nevertheless they must never be narrower than four Foot, to the end that if two Persons meet, they may commodiously pass one by the other. They will be convenient enough with regard to the whole Building, if the *Arches* under the Steps are made so large as to hold some Goods, or other necessary things; and convenient likewise for the Persons that come up and down, if the Stairs are not too steep, nor the steps too high. Therefore they must be twice as long as broad. The Steps ought not to exceed six Inches in height; and if they be lower, they must chiefly be so to long and continued Stairs, for they will be so much the easier, because one needs not lift the Foot so high: but they must never be lower than four Inches. The breadth of the Steps ought not to be less than a Foot, nor more than a Foot and a half. The Ancients used to make the Steps of an odd number, to the end that beginning to ascend with the right Foot, they might end with the same Foot, which they took to be a good Omen, and a greater mark of respect so to enter into the *Temple*. It will be sufficient to put eleven or thirteen steps at most to a flight, before one comes to half-pace, thus to help weak People, and of short breath, that they might rest a little, and that if something happens to fall from above, it may stop there.

STAIRS are made either strait, or winding. The strait may be made either divided into two *Branches*, or Passages, or quite square, in such a manner that they turn on four sides. * To make them in this last manner, all the space must be divided into four parts, whereof two must be for the Stairs, and two for the va-

cancy

* Plate XL.

cancy in the middle, by which the Stairs should receive Light if it be left open. They may be made with a Wall within, and then within the two parts which are allow'd for the Stairs, the Wall is included, which makes the *Cafe* or *Newel*; tho' there is no necessity to do it, for it may be done without a Wall within. These two sorts of Stairs were invented by *Signior Lewis Cornaro*, a Gentleman of an excellent Genius, as one may judge by the Design of a very fine *Gallery*, and a magnificent Palace which he has erected for himself at *Padua*.

As for *Winding Stairs*, which are also call'd *Cockle-Stairs*, some are round, some oval, some with a *Newel* in the middle, some open, especially when room is wanting; because they take up a great deal less than the strait Stairs, yet not so easy to go up and down. Those which are open in the middle are very handsome, because they may have light from above; and that those which are above, may see those who are coming up, and are also seen by them.

* THOSE which have a *Newel* in the middle are made in this manner. The diameter being divided into three parts, two are given to the Steps, and the third is for the *Newel*, as in the Design mark'd A: or otherwise the diameter may be divided into seven parts, three of which are for the *Newel*, and four for the Steps. Just in this manner is the *Stair-case* of the Column of *Trajan* at *Rome*: and if the Stairs are made circular, as in the Design B, they will be handfomer and longer than if they were made strait.

† BUT as it may happen that the space will not give room for these measures, then the diameter may be reduced and divided, according as it is here represented, C D.

** THE diameter of the Stairs open in the middle must be divided into four parts, two of which are for the Steps, and two for the middle.

BESIDES the aforefaid sorts of Stairs, there has been another sort of winding Stairs, invented by *Signior Marc-Antonio Barbaro*, a Gentleman of *Venice*, of an excellent Judgment, which is very convenient for narrower places. It has no *Newel* in the middle, and the Steps being winding or circular, are much longer: its division is the same as the aforefaid. See the Design E F.

†† THOSE which are Oval, are divided in the same manner, as the round; they are very handsome and pleasant, because all the Windows and Doors are in the middle, and at the head of the Oval, and are very commodious. I have made one open in the middle, at the Monastery of *Charity* at *Venice*, which is without a *Newel*, and has had a very good Success.

- A. *Winding or cockle Stairs with a Newel in the middle.*
- B. *The same with circular Steps.*
- C. *The same with a Newel of a less diameter with strait Steps.*
- D. *The same with circular Steps.*
- E. *Winding Stairs open in the middle.*
- F. *The same with circular Steps.*
- G. *Oval Stairs open in the middle.*
- H. *Another Oval-Stair with a Newel.*
- I. *Strait square Stairs open in the middle.*
- K. *Another with a square Wall in the middle.*

*† THERE is another very handsome manner of Stairs, which the magnanimous King *Francis* the First, caused to be made in the Castle of *Chambor*, near *Blois* in *France*. 'Tis built in this manner. There are four *Stair-cases*, which have

have four entrances, one entry to each: and they go up the one over the other in such a manner, that being made in the middle of the Building, it may serve for four Apartments; so that it is not possible to go from one into the other, and yet because it is open in the middle, they all see each other going up and down, without jostling one another. This Invention being new and beautiful, I have placed here the Design of it, and mark'd each Stair with its particular Letters on the *Plan* and *Section*, that one may know where each of them begins and where it ends.

THERE were also to the *Porticos* of *Pompey* at *Rome*, leading to the *Jews* quarter, three Stairs of the same kind of an admirable form; for being placed in the middle of the Edifice, and where they could not receive any light but from above, the Architect had set them upon Columns, to the end that the light might distribute it self to all parts alike. According to this Example, *Bramante*, the most skilful Architect in his time, made one at *Belvedere*; but without Steps, having the four Orders of Architecture, *Dorick*, *Ionick*, *Corinthian* and *Composite*.

To make those *Stair-cases*, the whole space must be divided into four parts, two whereof are for the void space in the middle, and one on each side of the Steps and Columns. There are many other fashions of *Stair-cases* in ancient Edifices, as *Triangular*; and of this sort are those of the *Cupola* of *St. Maria Rotunda*, which are open in the middle, and receive Light from above.

* IN the same City those which are in the Church of *Sancto Apostolo*, towards *Monte Cavallo*, are very fine; they were double, and many have since taken Models thereof: they led to a *Temple* seated on the top of the Mountain, as will appear in my Book of *Temples*; and of this sort of Stairs, is the last among the Designs.

CHAP. XXIX.

Of ROOFS.

HAVING rais'd the Walls to their intended height, and made the Vaults, laid the Joists of the Floors, brought up the Stairs, and perform'd all those things we have spoken of hitherto, we are now to raise the *Roof*, which embracing every part of the Building, and with its weight equally pressing upon the Walls, is as a band to all the Work. Besides that it defends the Inhabitants from Rain, from Snow, from the burning of the Sun, and from the moisture of the Night; it is also of no small help to the Building, casting off from the Walls the Rain-water, which altho' for a little while it seems to do but little hurt, yet in process of time causes much damage. *Vitruvius* says that the first Men built their Houses with flat Roofs, but finding that thereby they were not sufficiently defended from the Weather, necessity made them raise the middle, in order to give the Water its Current. These Roofs are to be rais'd to a higher or lower pitch, according to the Country in which they are. Wherefore in *Germany* they raise their Roofs to a very high pitch and sharp, by reason of the great quantity of Snow that falls there; covering them with *Shingles*, which are small pieces of thin Wood, for fear they should be crush'd by the great weight of the Snow. But we, who dwell in a more temperate Country, ought to chuse a Roof of a handfomer form, allowing only a sufficient Current for the Water. Therefore the breadth of the

Building is to be divided into nine parts, two of which will be a sufficient pitch, because if it was done of a fourth, the Roof would be too stiff; and the Tyles, or Slates, would hardly remain upon it; and in making it only of a fifth, it would be so flat, that the Tyles and the Snow must lie too heavy upon them. Gutters are commonly made round the Houses to convey off the Rain-Water by Pipes, or Spouts: and over these ought to be laid at least a Foot and a half of Wall, because they will be not only thereby the stronger; but this will preserve the Timber against the Rain, and the moisture of the Weather. There are many ways of framing the Timber of the Roofs, but when the middle Walls bear the Girders, they are easily laid on; and 'tis what I do much approve, because the out-Walls are less press'd, and if any end of the Girder should happen to rot, the Roof would not be in so much danger of falling.



The End of the First Book.

NOTES and REMARKS of INIGO JONES upon the
Plates of the First Book of *PALLADIO*'s Architecture :

Taken from the Manuscript of the said INIGO JONES, in the Library of
Worcester-College, Oxford, June 23, 1741.

PLATE IV. I. Going to *Naples* I saw a Wall of an ancient House of irregular Stones like this, and it did look very well.

PLATE V. This Wall is of the Temple of *Augustus*. I have often observed that such Walls have a grand look. In the Book of Antiquities you will find the manner of Walls in various Places.

PLATE VII. The Walls of the Town of *Naples* are of this sort.

PLATE X. A. The Impost of the *Tuscan* Arch is in height $\frac{1}{4}$ part of the Pilaster or Jamb B.

PLATE XI. K. The Pedestal is one Module in height, and made quite plain. See *Vitruvius* lib. 3. fol. 142.

I. The Base with one Boultel, or Torus, is taken from *Vitruvius*, and it is an antique Base at *Spoletto*, *Serlio* fol. 53. and the same Base is to the Columns of *Trajan* and *Antoninus*.

PLATE XII. F. The Architrave of the *Tuscan* Order is made of Wood, as high as it is broad, and the breadth is not to exceed the body of the Column under the Capital. See the first Design of this Order.

The Mouldings of the Base *Q.* Capital *I.* Frieze and Cornice, are taken from the Arena of *Verona*, and of other Antiquities and Amphitheatres.

The Wave, or *Gola Dritta*, and Fillet *I.* instead of the Ovolo, in my Judgment is very gracious.

The Cimasia and Fillet *G.* is not used, yet very good.

P. This Wave, or *Gola Reversa*, is put in the place of a Torus.

This Invention is partly taken from the Porfico of *Pompeio Serlio*, fol. 55.

PLATE XIV. The Trigliph over the Key-stone does well; the Key-stone is to be half the diameter at the bottom of the Column, and also the said Key-stone is to be according to the Column; but those of *Scamozzi* are better, which are by the height of the Architraves; therefore the Key-stones are slender as the Order is slender.

A. The Impost of the Arch is $\frac{1}{2}$ part of the Pilasters or Jamb C, in height from A to B.

PLATE XV. L. This Ovolo Rostrato is used in all the Cimasia's following, and is taken from the Temple of *Mars* the Revenger, lib. 4. Plate 11. and of many other Temples I have observed.

B. This Cimasia is too little.

The Attick Base. See the Temple of *Bacchus*, Plate 67; that of *Trevi*, Plate 71;

that at *Naples*, Plate 74; that at *Trevi*, Plate 75; that at *Seisfi*, Plate 82; and, that at *Pola*, Plate 86.

PLATE XVI. C. This Corona is taken from the Theatre of *Marcellus*; but the upper Members and under ones of the Corona are varied, the Frieze is taken entirely from the said Theatre of *Marcellus*: The Architrave is taken from the Temple in *Foro Boario*. See *An. l'Abacco* fol. 16. and *Serlio* lib. 4. fol. 20.

PLATE XVIII. A. This Key-stone is half the diameter of the Column at the bottom, and is in height twice the Archi-volto.

B. The Impost of the Arch is in height 1 part of 10 and $\frac{1}{2}$ of the Pilaster or Jamb from B to C, which is half as much more as the thickness of the Pilasters or Jamb.

PLATE XIX. *Palladio* likes this Base better than that described by *Vitruvius*; this is the Attick Base with a small Boultel or Torus B, under the Cimbria. This Base is taken from the Temple of *Peace*, Plate 4, and from the Temple of *Jove*, Plate 32, and from the Temple of *Mars*, Plate 45.

The Cimasia *G* is taken from the Temple of *Nerva*, Plate 17.

The Cimasia *GG* is taken from the second Temple of *Nifmes*, Plate 94, but varied very much from it, and has an Ovolo over the Wave, and a Boultel and Cimbria instead of the Caisement; it may be called *Palladio's* own Invention.

When there is a Caisement, or *Gola*, the Pedestal *H* has no Cimbria, for that will serve instead of it. See the Pedestal of the Composite Order, Plate 34.

I. I. This side of the Base is taken from the Temple of *Nerva*, Plate 17. The other side marked single *I.* is taken from the Temple of *Fortuna Virilis*, Plate 34.

PLATE XXI. This is *Vitruvius's* Ionick Base, but to my mind is not good.

PLATE XXII. E. The square Modillions are taken from the Temple of *Concordia*, Plate 97. but under them is a Dentil, and under it an Ovolo and Cavetto.

PLATE XXIV. A. The Key-stone is half diameter of the Column at the bottom by the Base.

B. The Impost is one part in height of the 10 parts, but $\frac{1}{2}$ of the height of the Pilaster or Jamb, from B to C, which is as much with the Astragal; which in all has twice the thickness of the Membretto.

PLATE XXV. This Base is taken from the Temple of *Nerva*, Plate 18. but the Astragal differs something. See likewise the Temple

Temple of *Nisimes*; but in that there are two Tondini's and a Fillet under the Calcement, and one Tondino above it, Plate 90.

All the Cimasia's of the Pedestals, *Palladio* does compose according to the Base of the Columns; but the Ancients varied them more.

The Base of this Pedestal is taken from the Temple of *Pola*, Plate 86. the Carving is added, and the Members have better proportion than the Base of the Temple of *Fortuna Virilis*, Plate 34.

PLATE XXVI. A. The Cornice has as much Projection as its height.

B. Is the Depth of the Coffers of the Rosés, which is the full depth of both Ovolo and Fillet of the Coffers.

C. The Fillet is over the Gullet of the Cartooches or Modillions.

D. I do find the numbers within the prick'd Line, to be false; for there is in the upper part of the Cornice set down 19 parts and a half, whereof I can find no more than 17 and a quarter.

The Field or Coffers of the Rosés in the Soffita of the Corona of the Cornice is a perfect Square from E to F. The Cartooches G is half of it in width of the Coffers.

H. The Gullet is the *Soffita* of the upper *Cimarella* of the Cornice.

I. Is the Margin round the Square of the Coffers, and this was used when the Spaces were too narrow to make a perfect Square; but when the Spaces were too broad, the Coffers of the Rosés were longer than broad; both are defective. In most of the Ancients this said Space I. was broader than long, which to my mind is much better.

From K to L of the Abaco is one diameter and a half, and this Rule is to be observed in all the Corinthian and Composite Capitals; when you are to make double Columns at distance one from another $\frac{1}{2}$ diameter, the Abaco's will but just touch.

M. The Bell or Campana of the Capital goes straight up to the biggest Leaves.

N. The Bending Leaves are the 4th part of their height.

O. The perpendicular prick'd Line shews the Bowing of the lesser Leaves to be even with the Ovolo of the Bell.

P. Is the thickness of the 1st Tiers of Leaves, mark'd in the Plan of the Capitals.

Q. The thickness of the 2d Tiers of Leaves, which is to the Depth of the Flutings.

The prick'd Line is the Projection of the Leaves from the extreme part of the Abaco, to the extreme part of the Astragal, which is Projection enough. See *Scamozzi*, lib. 6. fol. 139.

PLATE XXVIII. A. This Key-stone is $\frac{1}{2}$ the diameter of the Column at the bottom, and is as high as the Archivolto, or the 9th part of the Opening of the Arch.

B. The Impost is in height 1 part of 10 and $\frac{1}{4}$ of the height of the Pilaster or Jambs from B to C, which is as much besides the Astragal as the Membretto is thick.

PLATE XXIX. B. This Base is composed of the Attick and Ionick Bases, and is taken from the Rotonda, Plate 60. and from the

Temple of *Neptune*, Plate 101. and from the Temple of *Mars* the Revenger, Plate 11. But there are some Alterations, as an Astragal between the under Boultel Fillet, and the Cimbria. Being large, there is no Astragal under it, but most of all from the Temple of *Jove Stator*, Plate 52.

The height of this Impost is equal to the thickness of the Pilasters or Jambs.

This Cimafium of the Pedestal under the Base of the Column is taken from the second Temple of *Nisimes*, Plate 94. but there is an Ovolo over the Wave, where the Cimbria is C. Also there is a Boultel over it, or an Orlo. None of *Palladio's* Pedestals has a Cimbria but this. See the Temple of *Antoninus* and *Faustina*, Plate 24.

The Base of this Pedestal is taken from the Temple of *Scifi*, Plate 82. but the Members of that are not carved, for I find the Ancients never carved their Calcements for more Solidity, and because the Bases being on the Ground, neither the Cimasia of a Pedestal for the same reason.

PLATE XXX. When a Cornice stood far from the Eye, the Ancients did make the Members larger, and sometimes did put Modillions next to the Frize, which made the Architrave, Frize, and Cornice, shew all in one. Of this Secret, *Scamozzi* has been purblind, and understood it not. See the *Coliseo's* upper Order, *Servio* fol. 65. lib. 3. This Cornice is taken from the Temple of *Jove*.

The double square Modillions of the Composite Cornice are taken from the Temple of *Jove*, and of the Frontispiece of *Nero*, Plate 33.

In these two Temples the Waves are richly carved, but in this it is not.

Scamozzi, lib. 6. fol. 20. taxes *Palladio* for this Cornice wrongfully, for having the Members under the Modillions; not knowing that the Modillions and the two Fascias stood far from the Eye.

The Architrave is taken from the said Temples, the second Fascia, and Cimasia extraordinary; but in them is an Ovolo under the Cavetto, and in this is a Gola reverse: the Ovolo does agree better with the Cavetto, and it is in the Architrave of the Temple of *Pallas*. An House, 'tis true, that in the Architraves of Doors is used as in the Temple of *Vesta*, Plate 72. and in the Temple of *Nisimes*, Plate 90. but not in the real Cornices.

PLATE XXXIV. The manner of Arches are six, viz. A Crochiera I. a Fascia Q, a Remenato, or Part of a Circle H, a Rotonda G, a Lunette P, and a Conca N and K; which two last are both alike, only one has more Sesto than the other.

That a Fascia is the same as a Conca, and terminates to the Wall.

There are mixt Arches, which I note apart.

O. This shews the height of the inside of the Lunette.

Scamozzi taxes *Palladio* for using the diagonal Line, as being so near a Square and half.

K. The Conca is less in the Square than the others, and more in Sesto.

The Center to make the Arch K, is the Base of

of the Triangle M. I. The Fascia Q. I have seen in many Galleries, long Rooms, Portico's, and Entries.

I observed the Crochiera or Groining Arches, are not much used to the Rooms above stairs. The Conca is more ornamented for the upper Rooms. The Arches and Fascia are often enrich'd and adorn'd with various sorts of Compartments.

This is from the Corners to the Square, half of the Ground in breadth, and this is the common Rule of the Bricklayers; but this holds not ever, or very seldom. Some Rooms have Lunette in the Corners and Square in the middle.

PLATE XXXV. This is a plain Cornice of *Palladio*, that has a Fillet under the Ogee marked B; but *Scamozzi* puts this Cornice to the *Tuscan* Doors, lib. 6. fol. 66.

O. This is a square Fillet over the Ogee.

X. This is another plain Cornice of *Palladio*, and *Scamozzi* puts it to the Dorick Doors, lib. 6. fol. 81. the Architrave has no Astragal under the Gola reversa; he puts this Architrave to the Ionick and Composite Orders, and there is an Ovolo between the two Fascias carved with Leaves, which is all the difference he makes.

The Projection of the bottom of the Gola reversa, is $\frac{1}{4}$ part of the Square, as the Pricks shew.

PLATE XXXVI. F. This Architrave is divided into 8 parts, 5 are to be given to the plain Fascia, the other 3 parts are to be subdivided into 9. 4 for the Gola reversa, 3 for the Hollow, and 2 for the Square or Fillet.

In the ancient Architraves, where there is an Ovolo under the hollow, they used to put an Astragal under it carved, with Beads.

The Invention of the Cimasia of the Architrave F, is taken from the *Temple of Peace*,

lib. 4. Plate 4. Plate 33. *ibid.* and Plate 45. *ibid.* but those Arches have an Ovolo carved under the Cavetto.

I. The Cornice has few Members and plain, it may serve very well to the Dorick Order. *Scamozzi* puts this Architrave to the Corinthian Order, with two Fascias, and a Boulrel between.

K. This other kind of Cornice has more Members, and *Scamozzi* puts this to the Ionick Order, with Dentils carved.

H. This Architrave is of another Invention; the Cimasia of the Corona of the Cornice, *Scamozzi* likewise puts to his Roman Order, as he calls it, and makes the Dentil plain, and carves the Ovolo and Gola reversa.

PLATE XXXVIII. D. The winding Stairs have a Pillar in the middle, with crooked Steps, which makes the going wider than the streight ones.

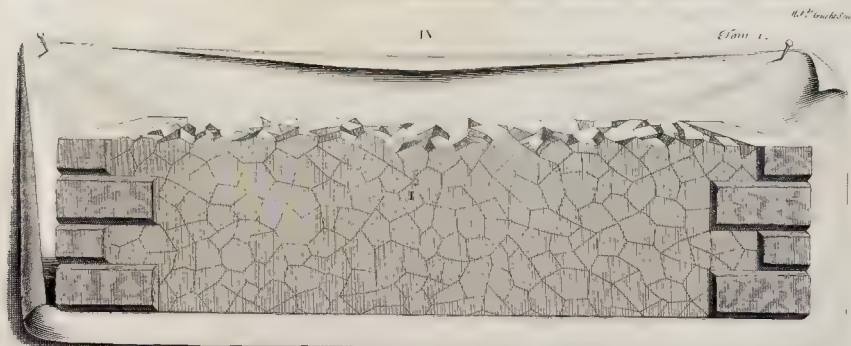
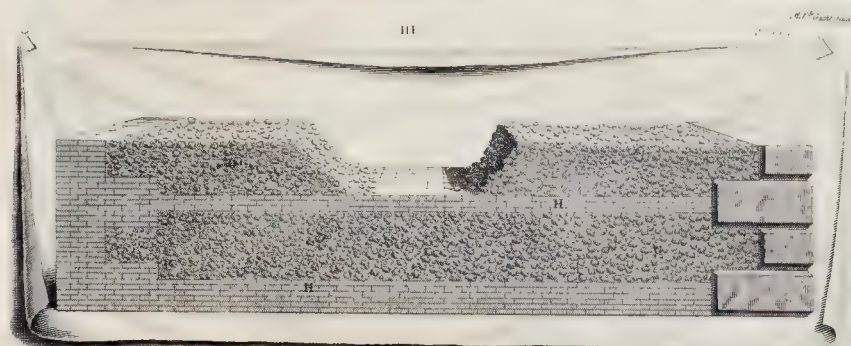
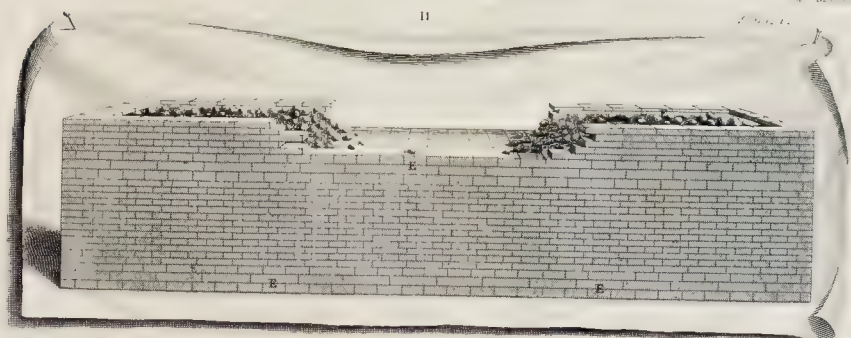
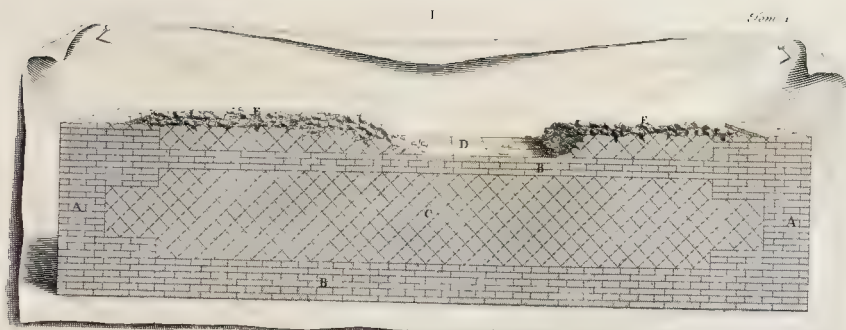
E. This is the Center of the circular Steps, which is taken from every three Steps F.

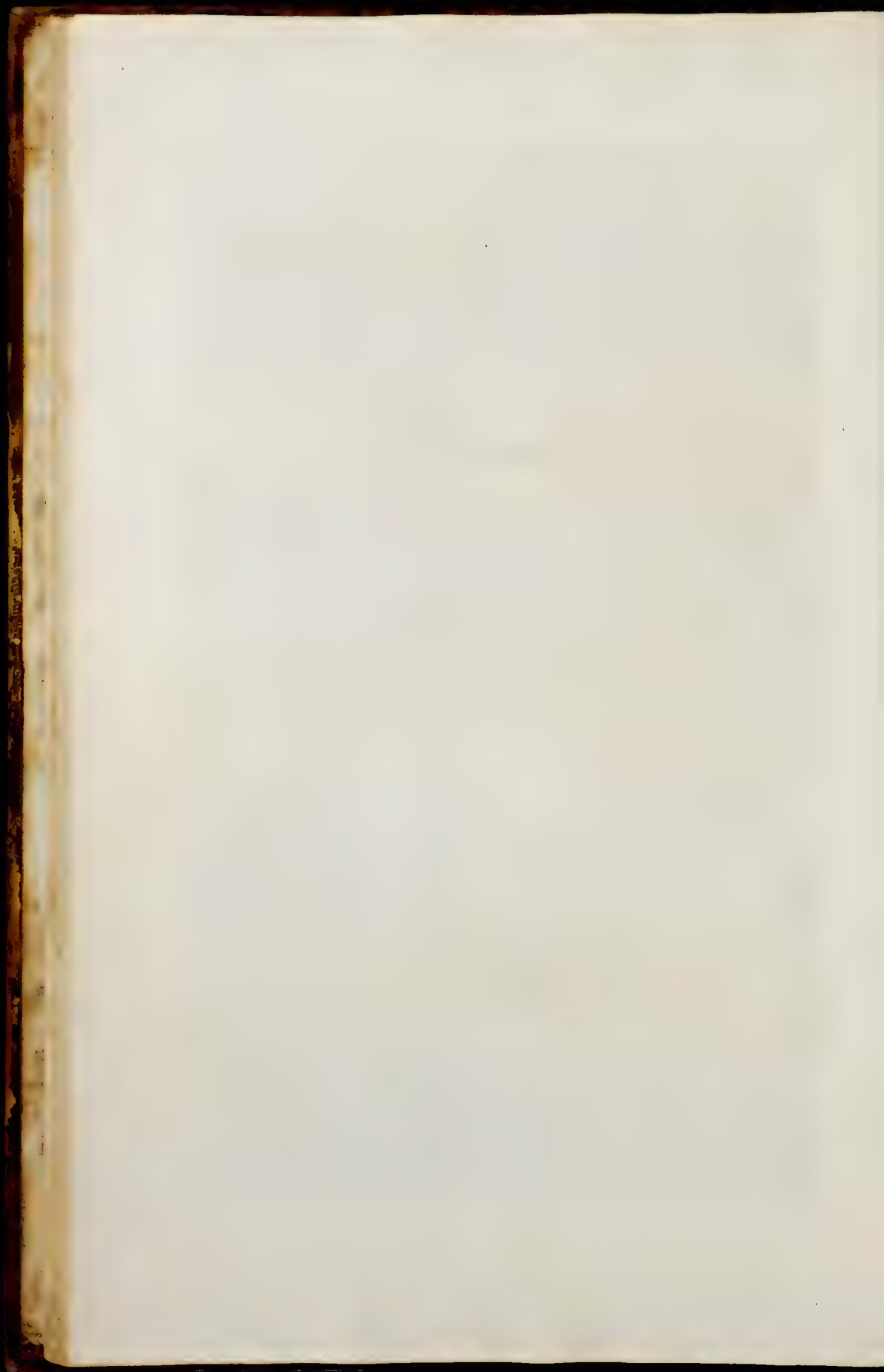
PLATE XXXIX. F. The winding Stairs is quite open in the middle, and this Mark G. is the Center of the circular Steps, which is taken from every four Steps H, which makes the going wider than the other.

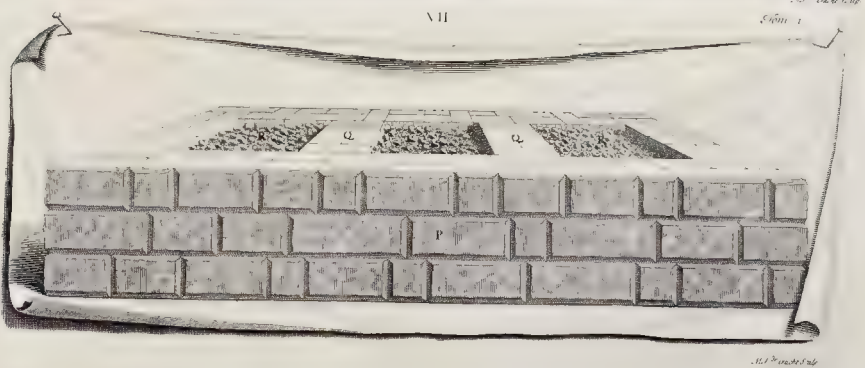
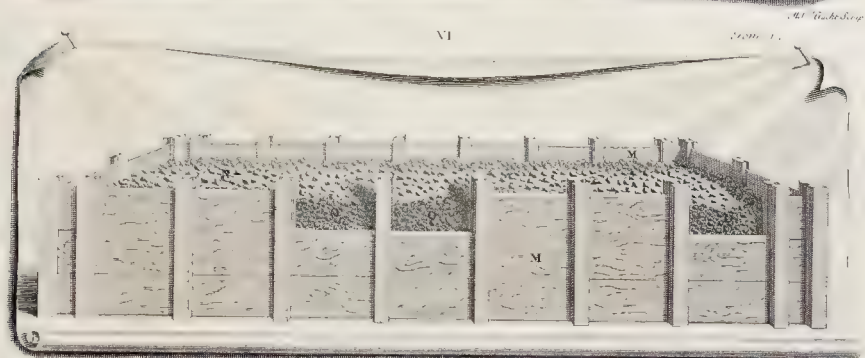
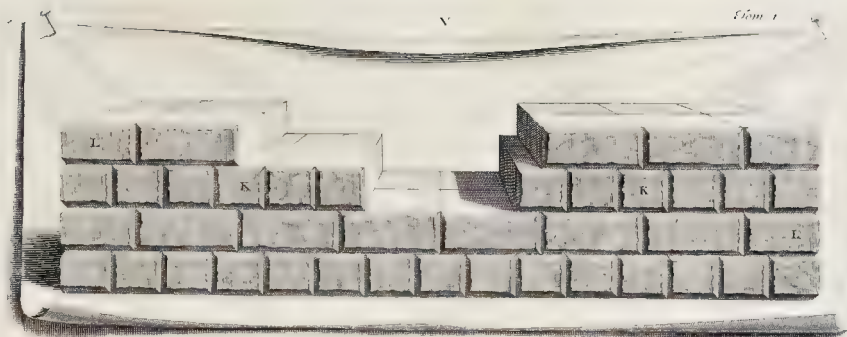
PLATE XLII. I have seen these Stairs at *Chambur* in *France*, and there are but two ways to ascend; and round the Newel is a Wall with Windows in it, to give light to those Stairs. I am sure *Palladio* has heard talk of this Stair-case, and from them he has invented these, which are much more magnificent.

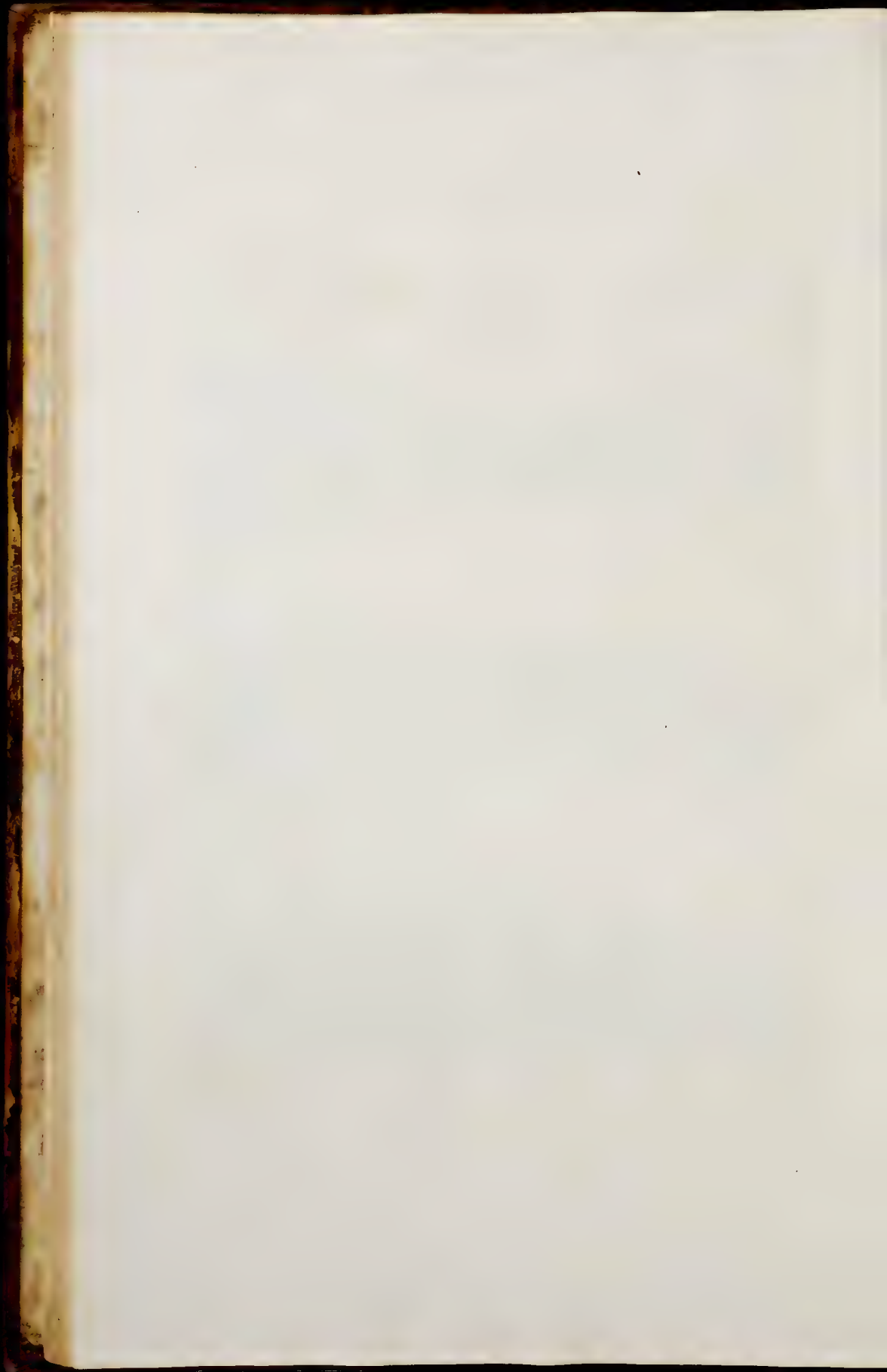
PLATE XLIII. This double Stair-case is very easy to ascend, up a Hill, or some Temple, or Palaces, or other Places: There are such Stairs at *St. Apostoli*, by *Monte Cavallo* at *Rome*.

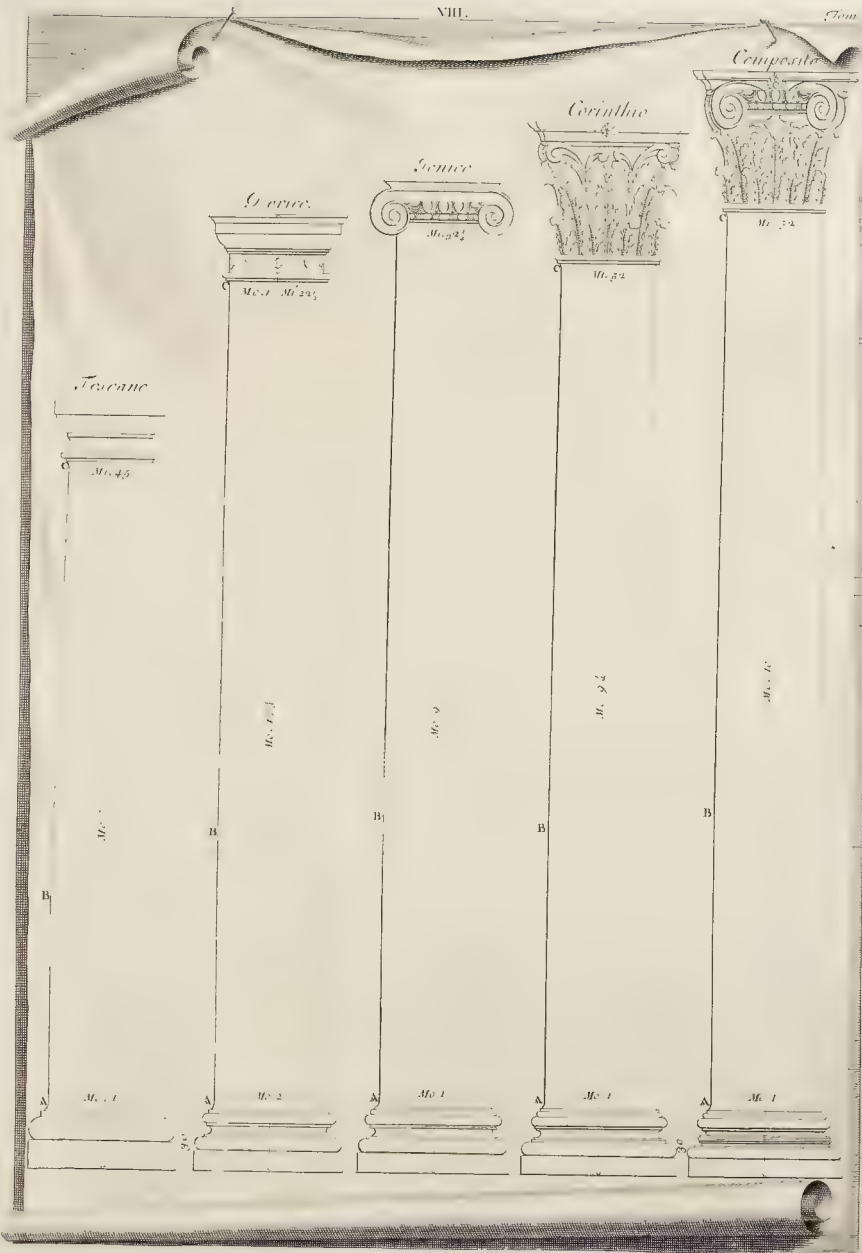




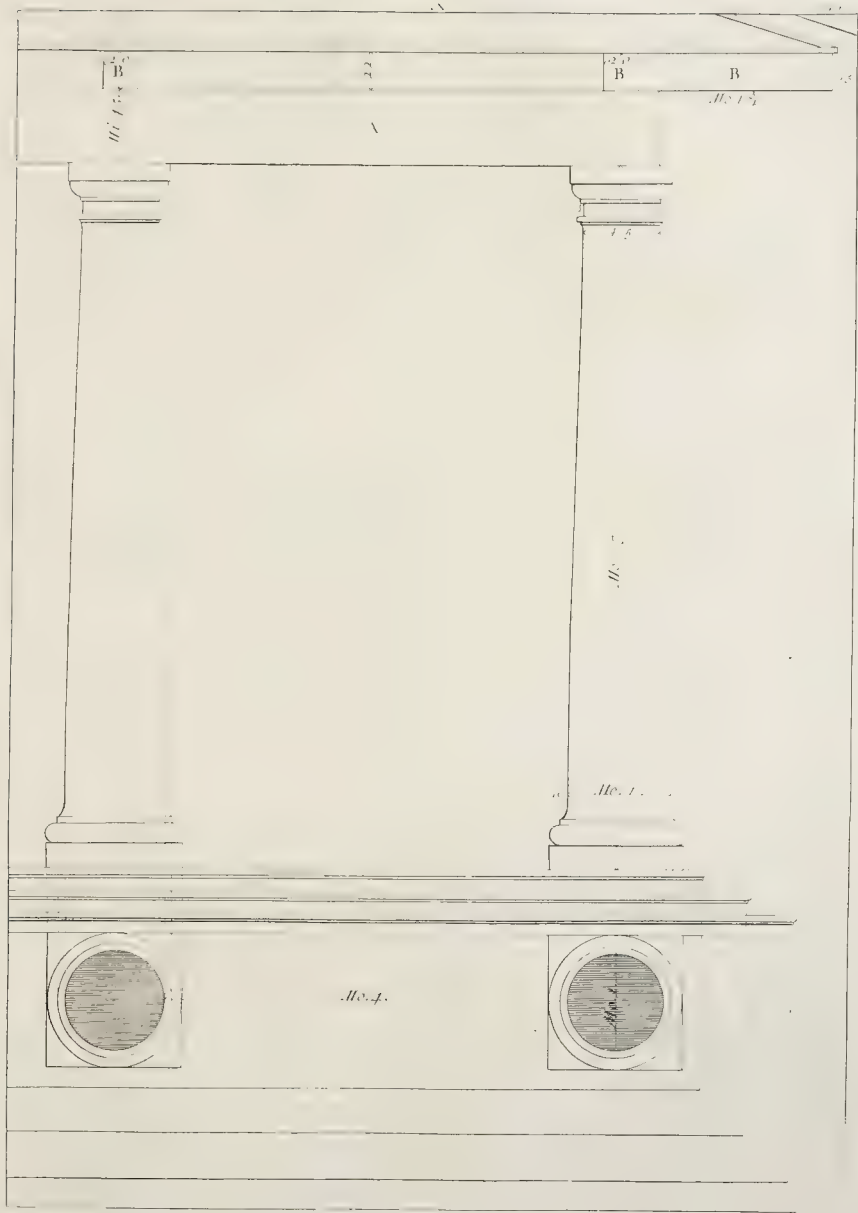






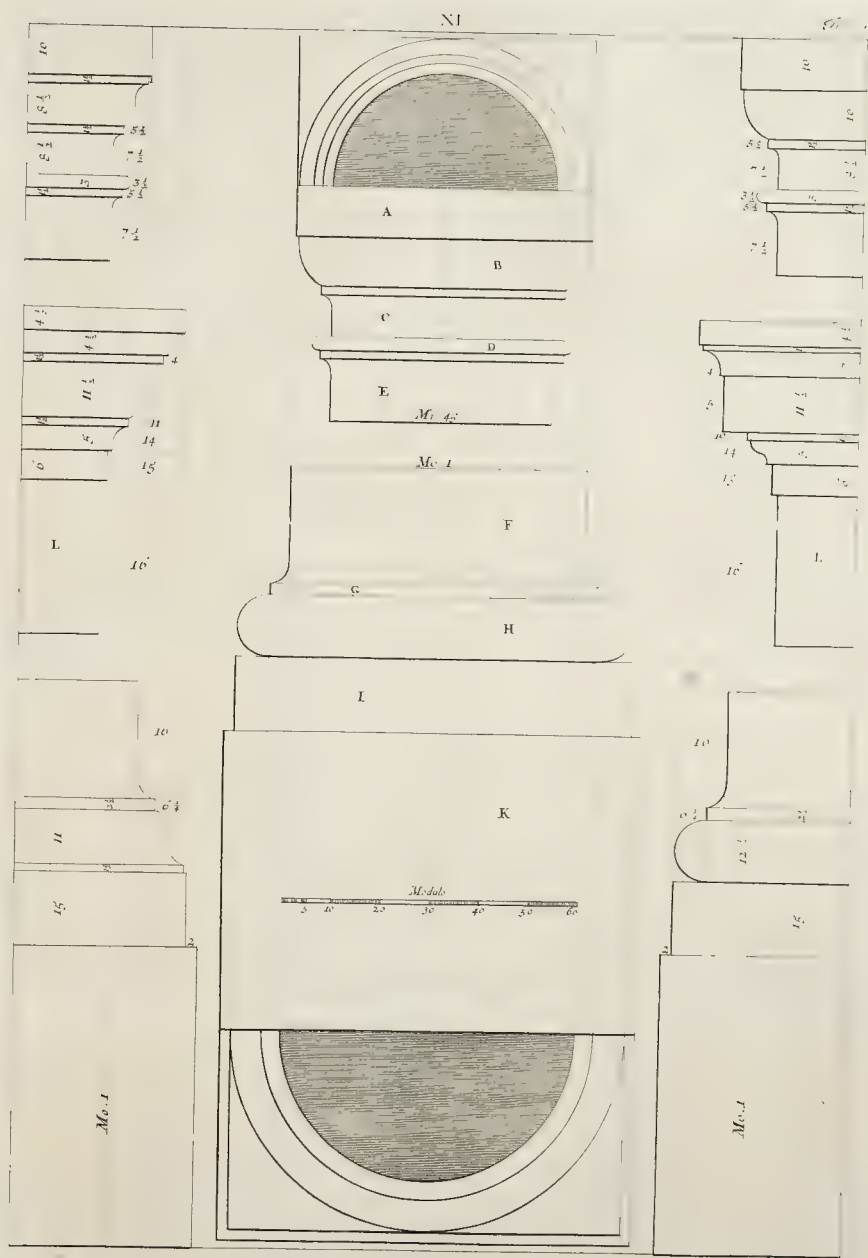


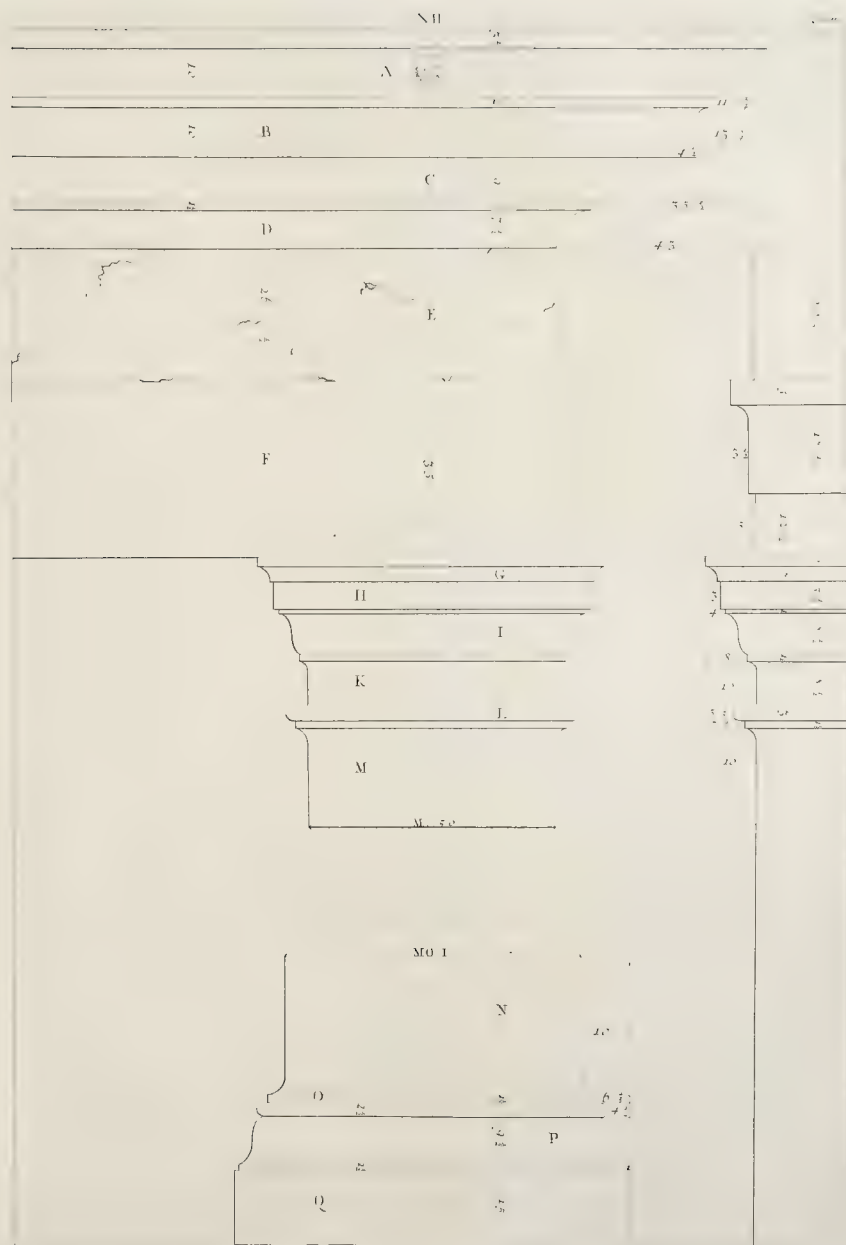


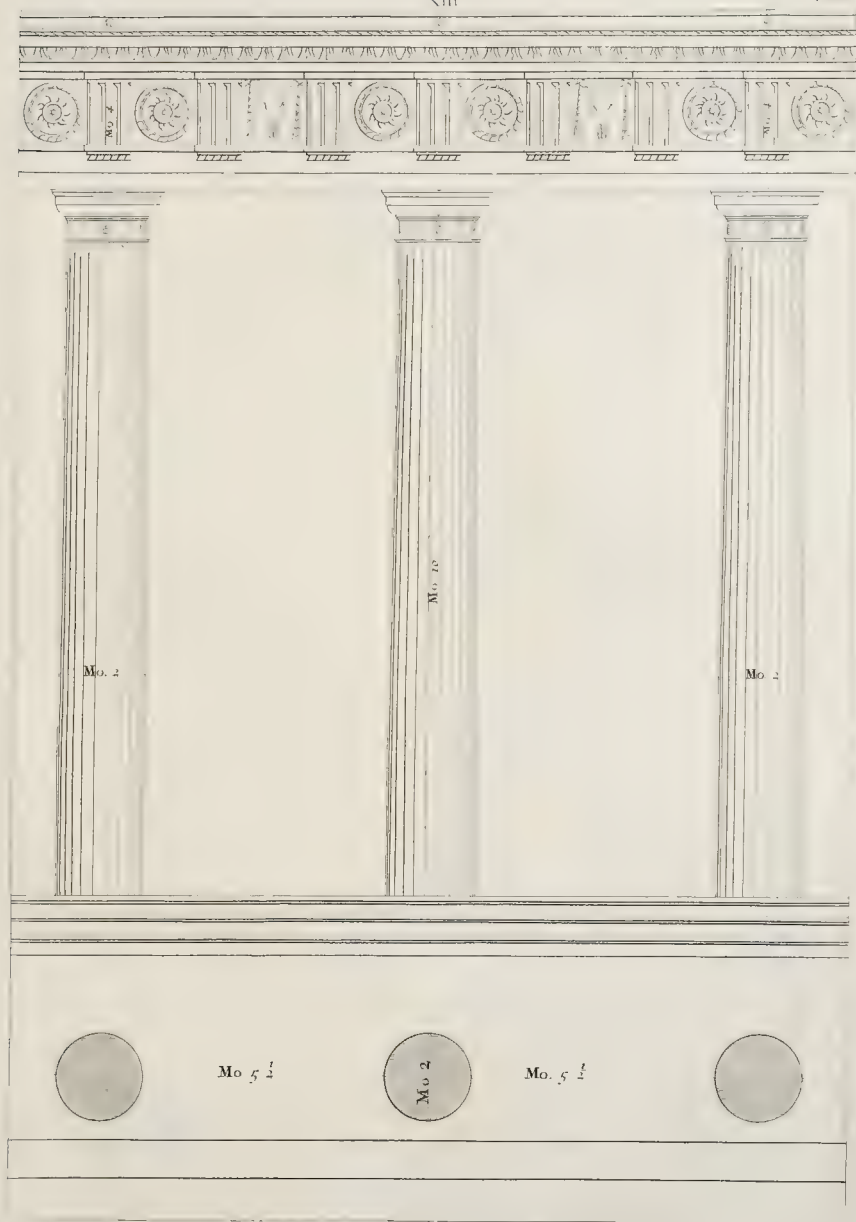




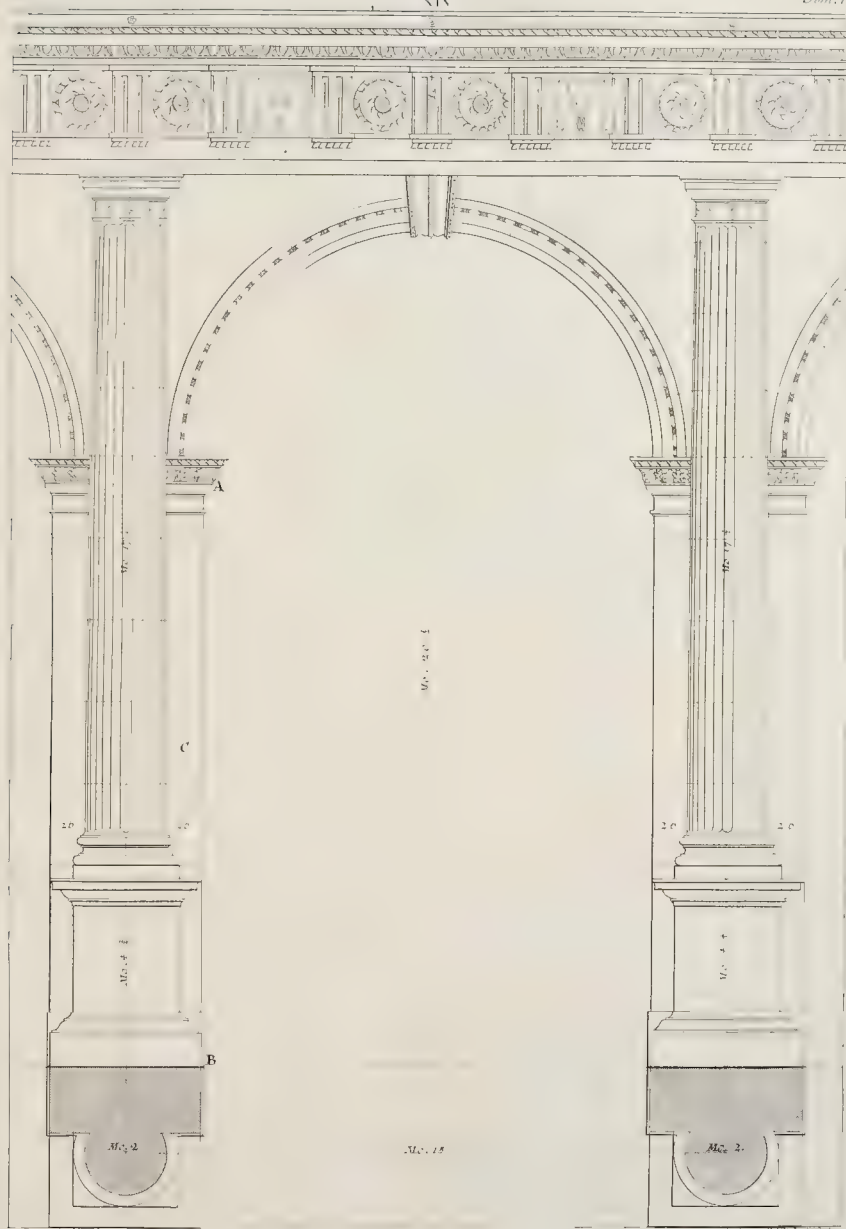




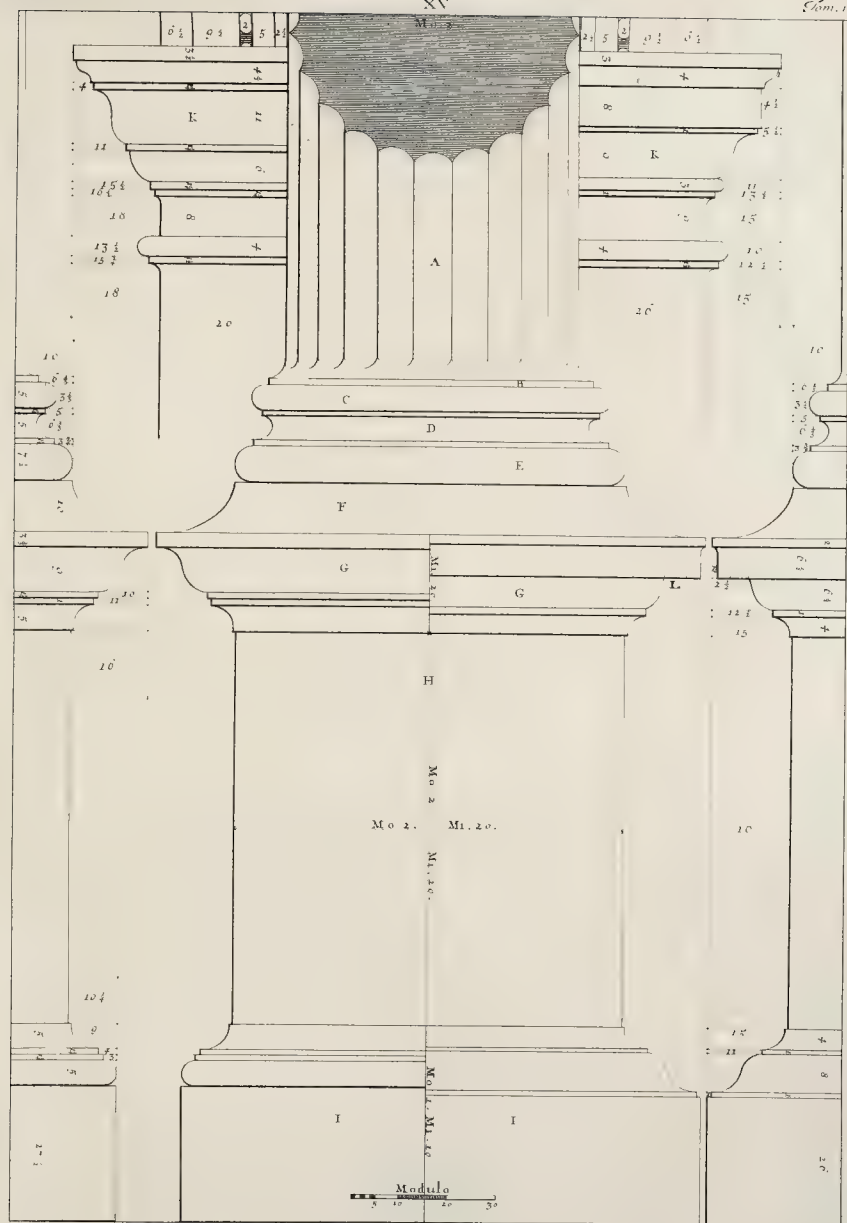




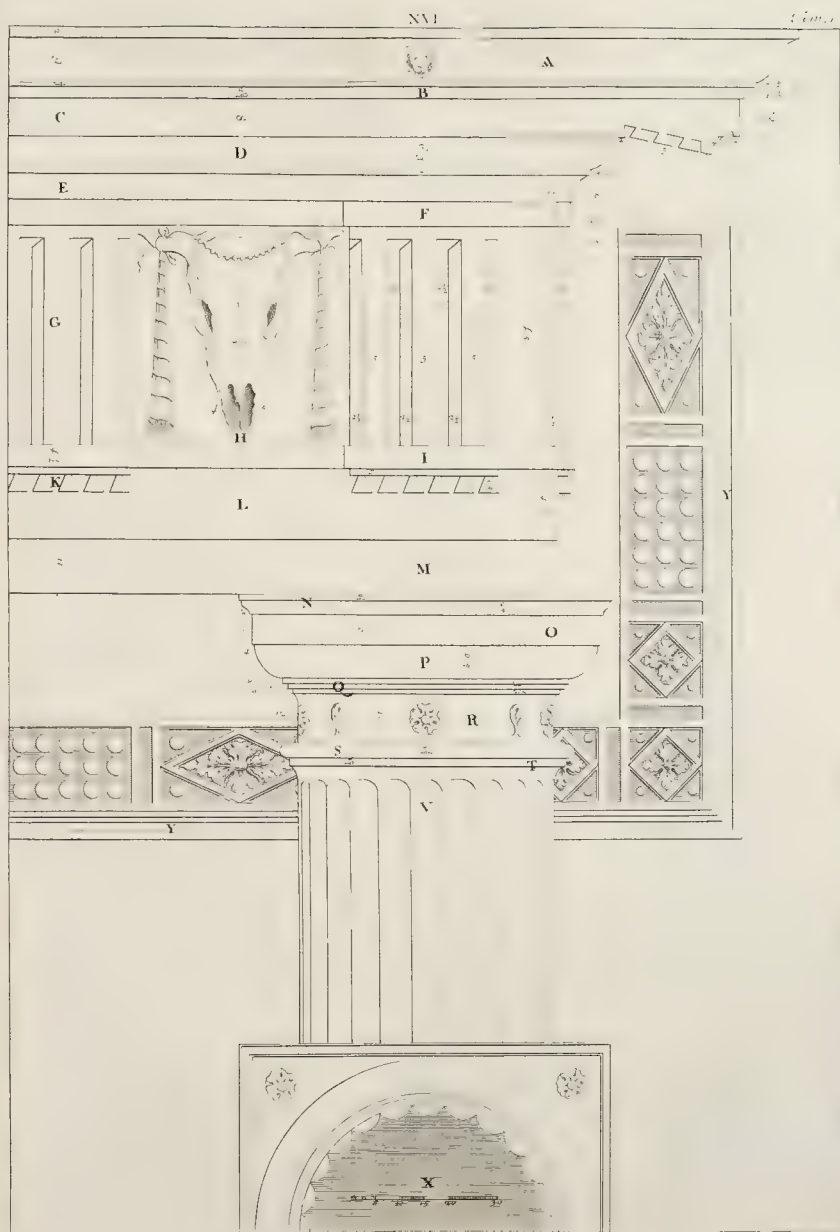










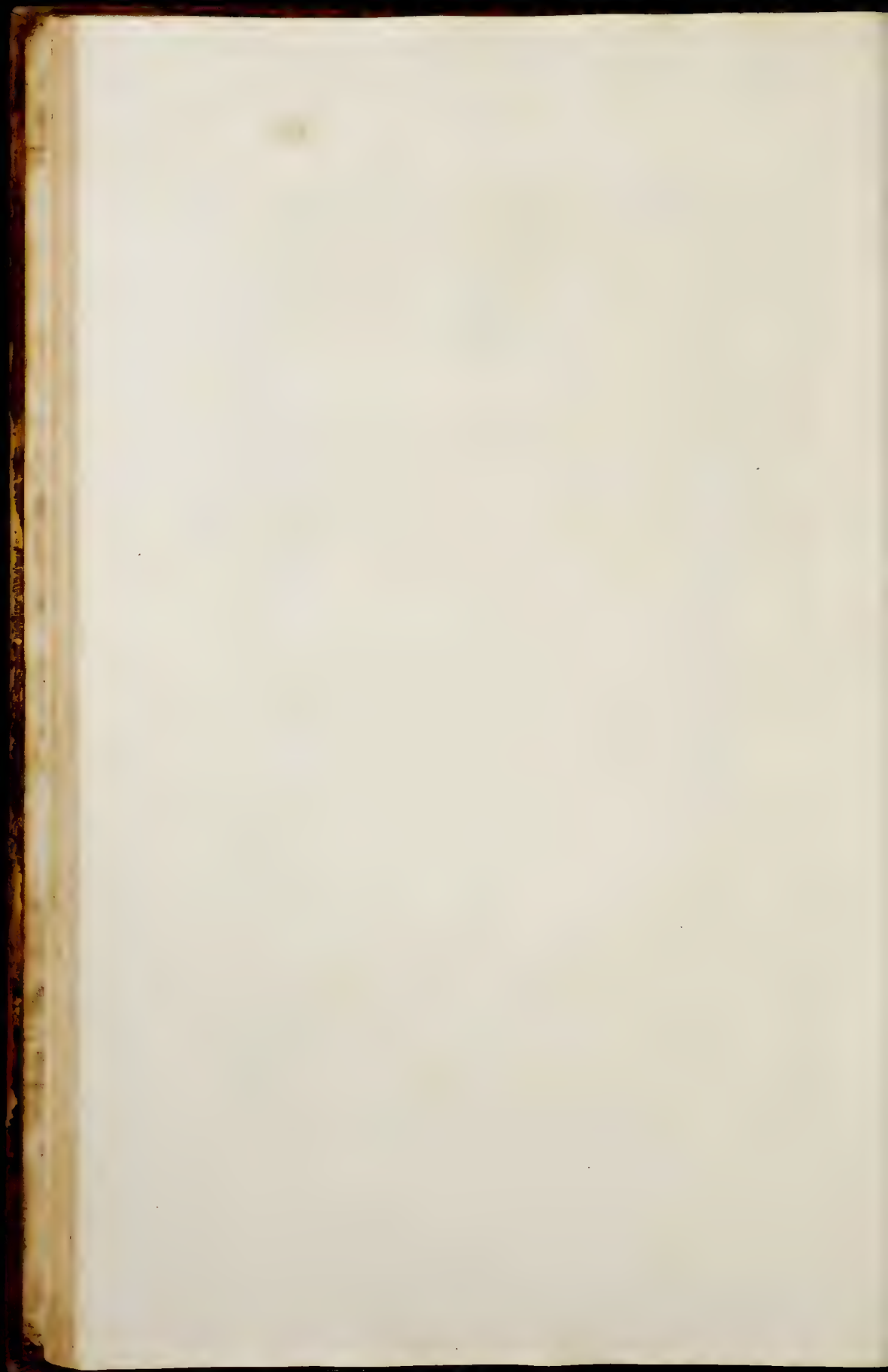


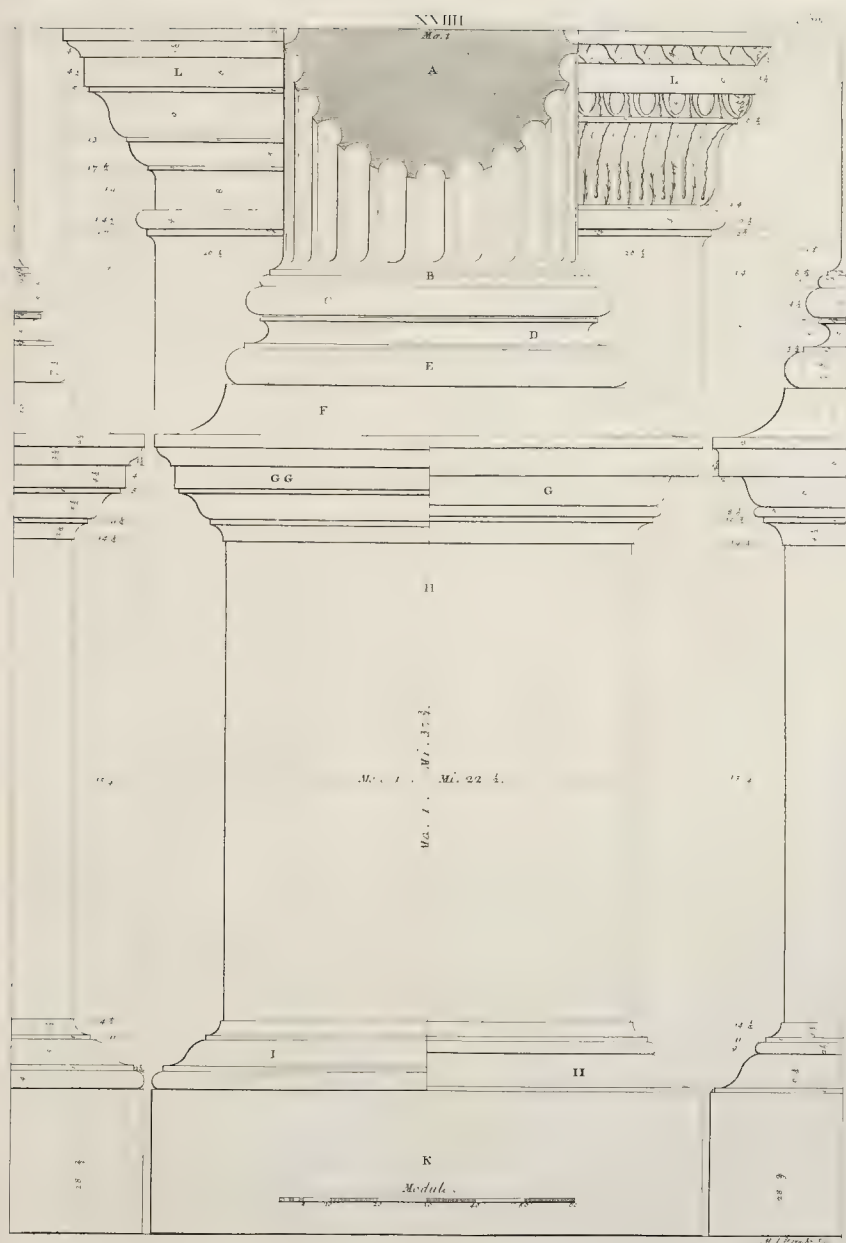


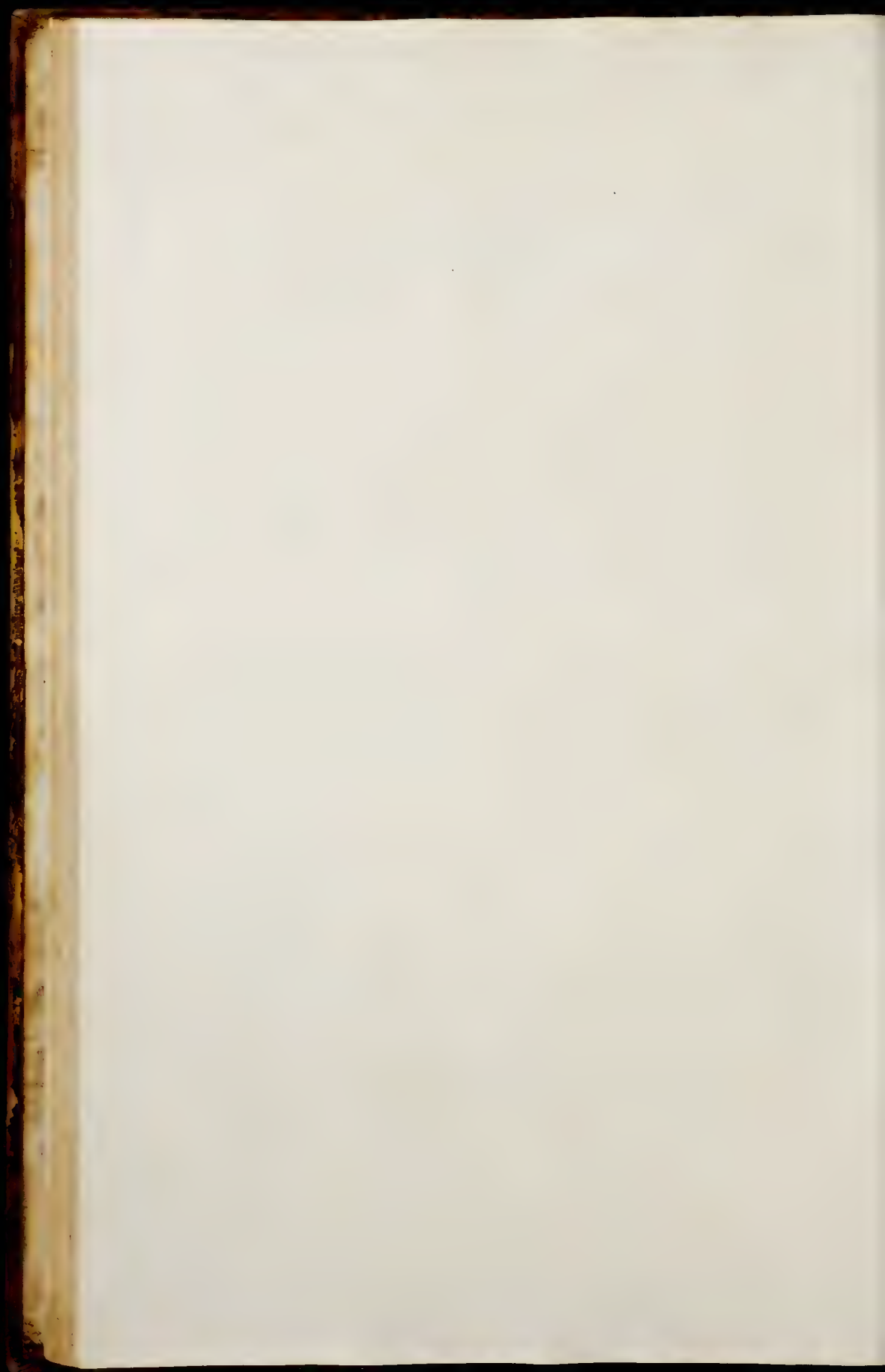


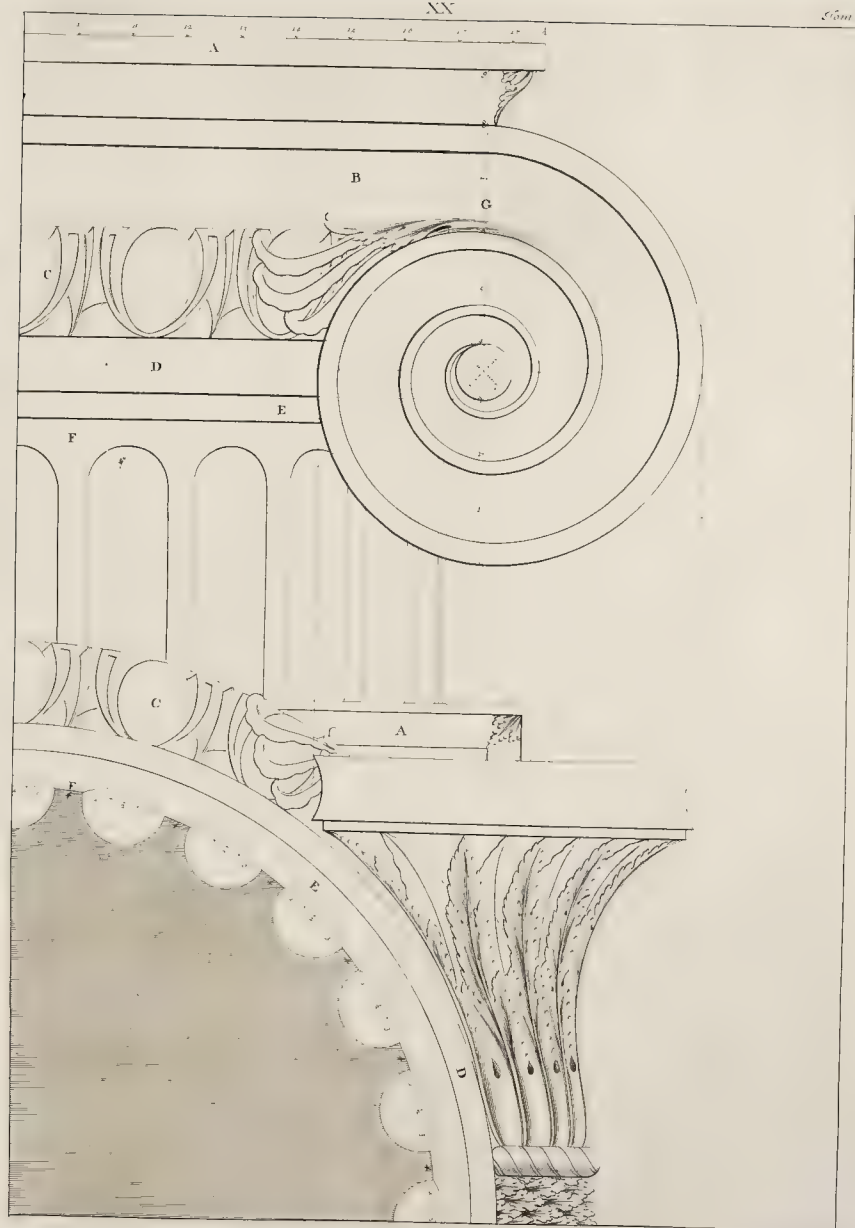


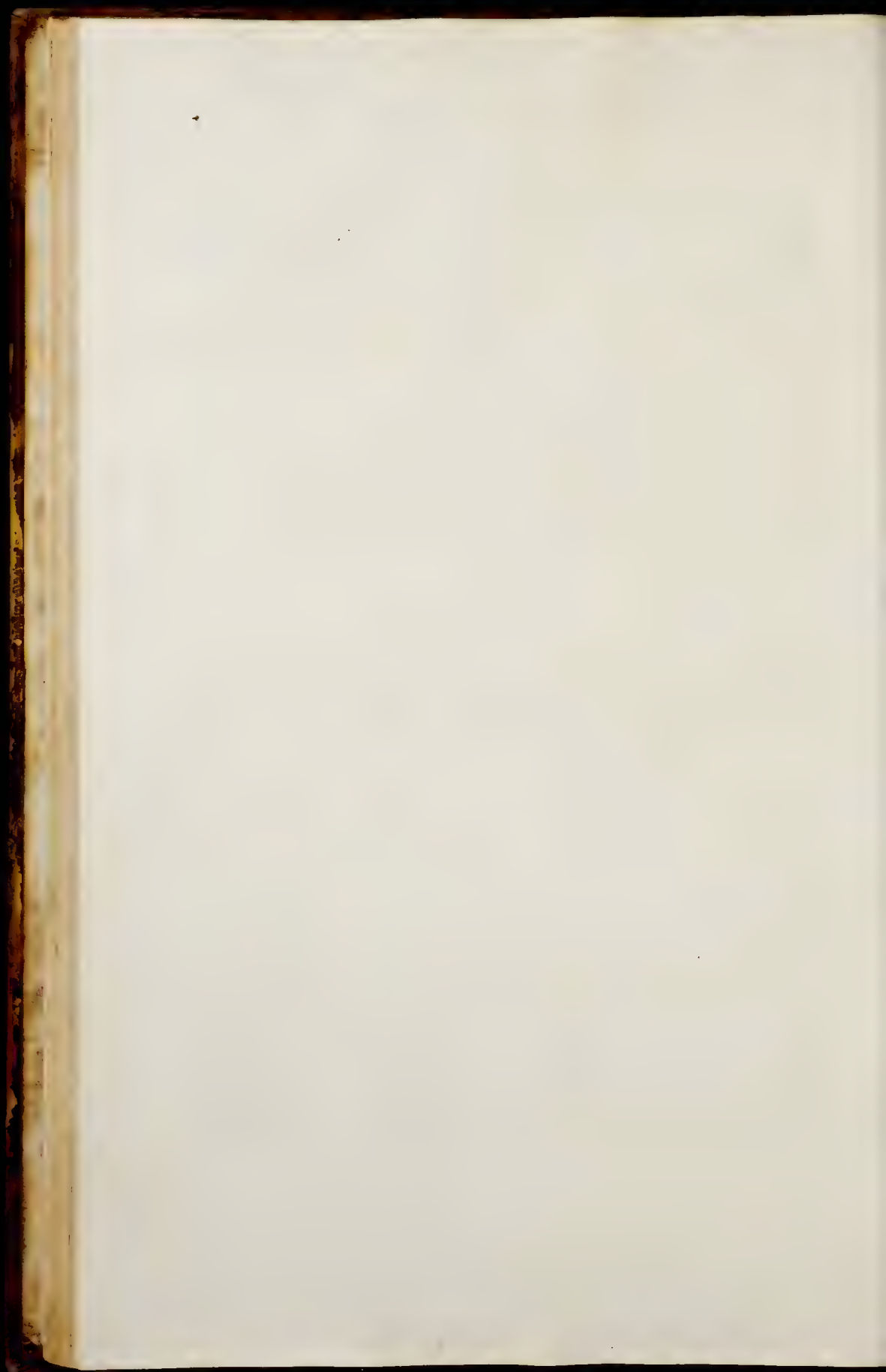


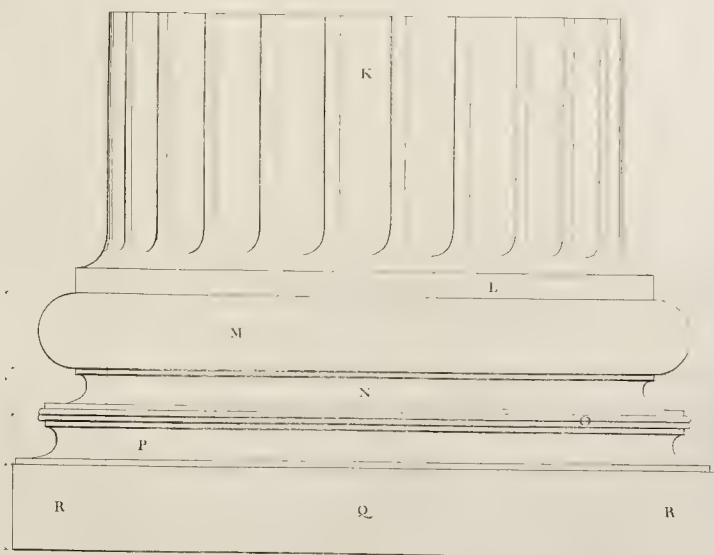
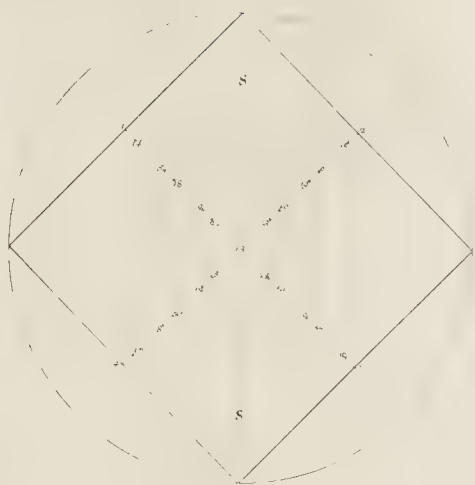




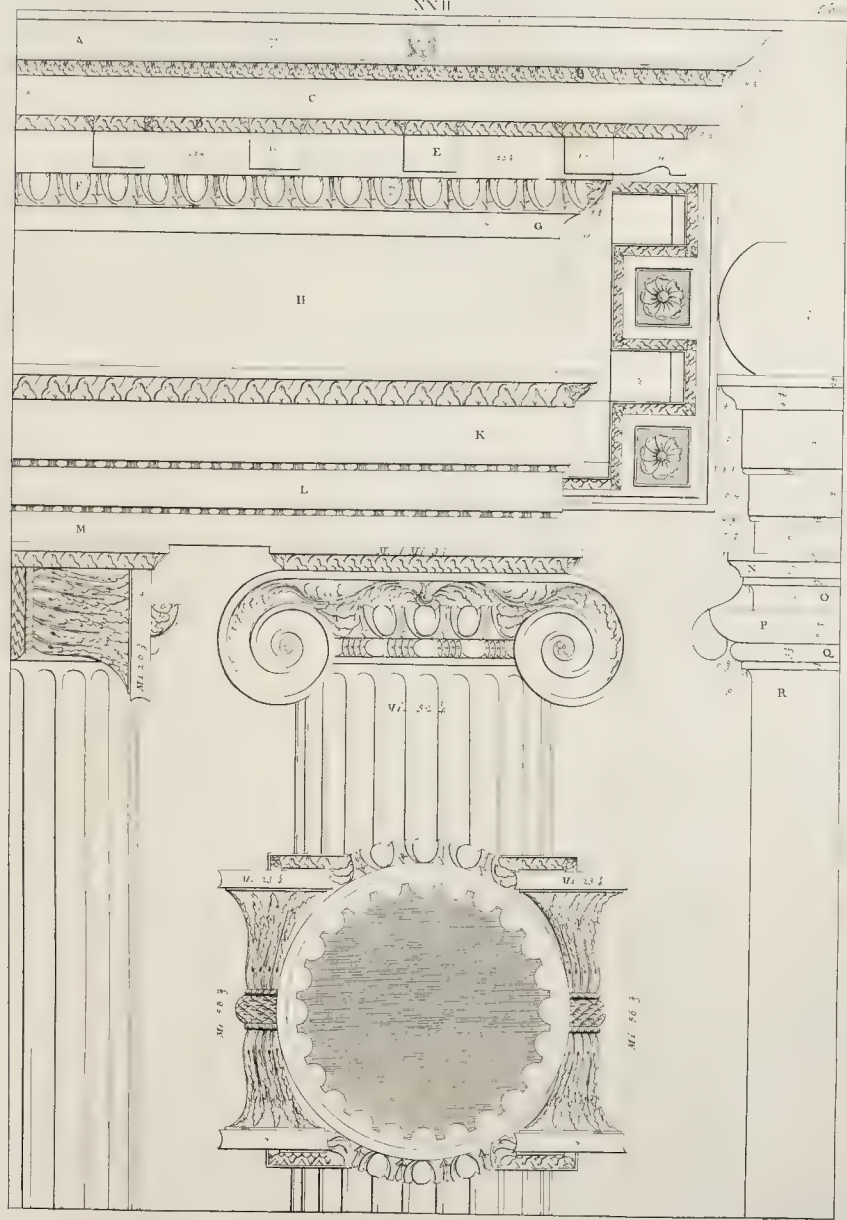




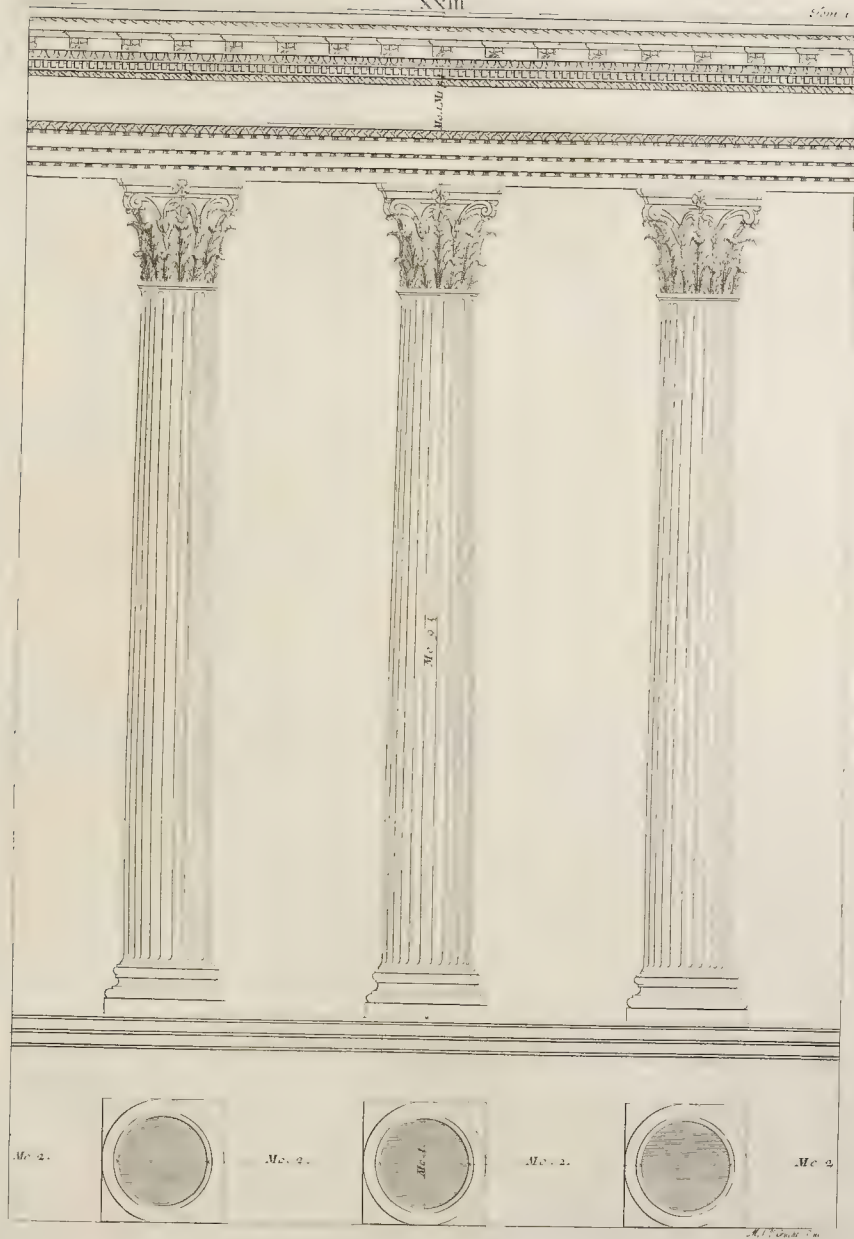




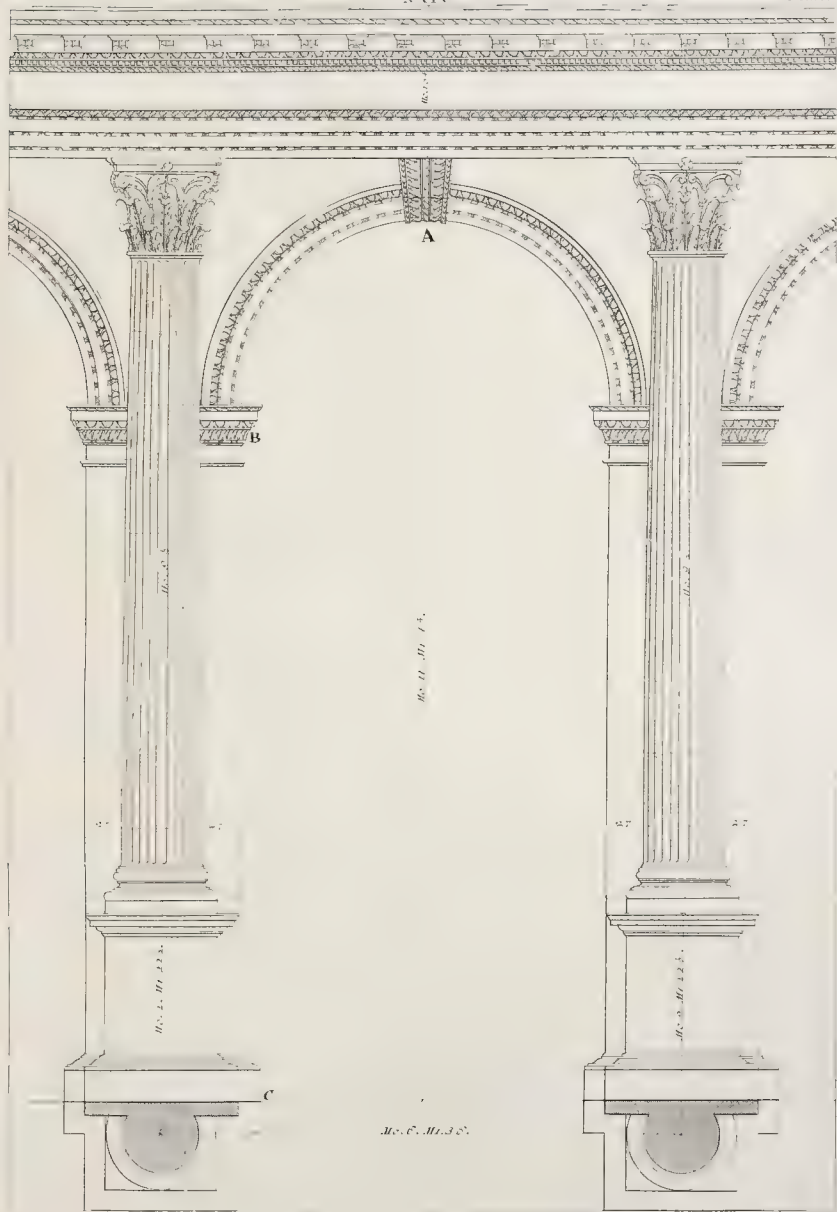




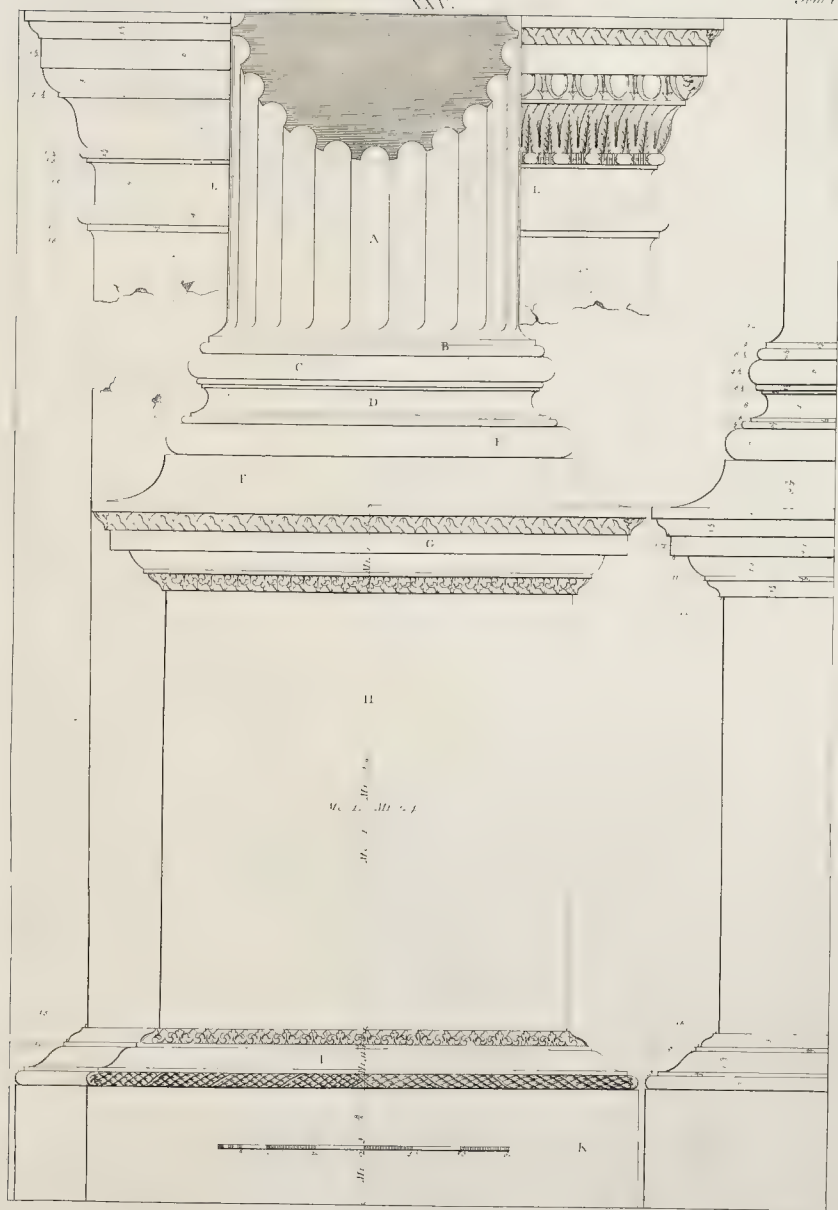


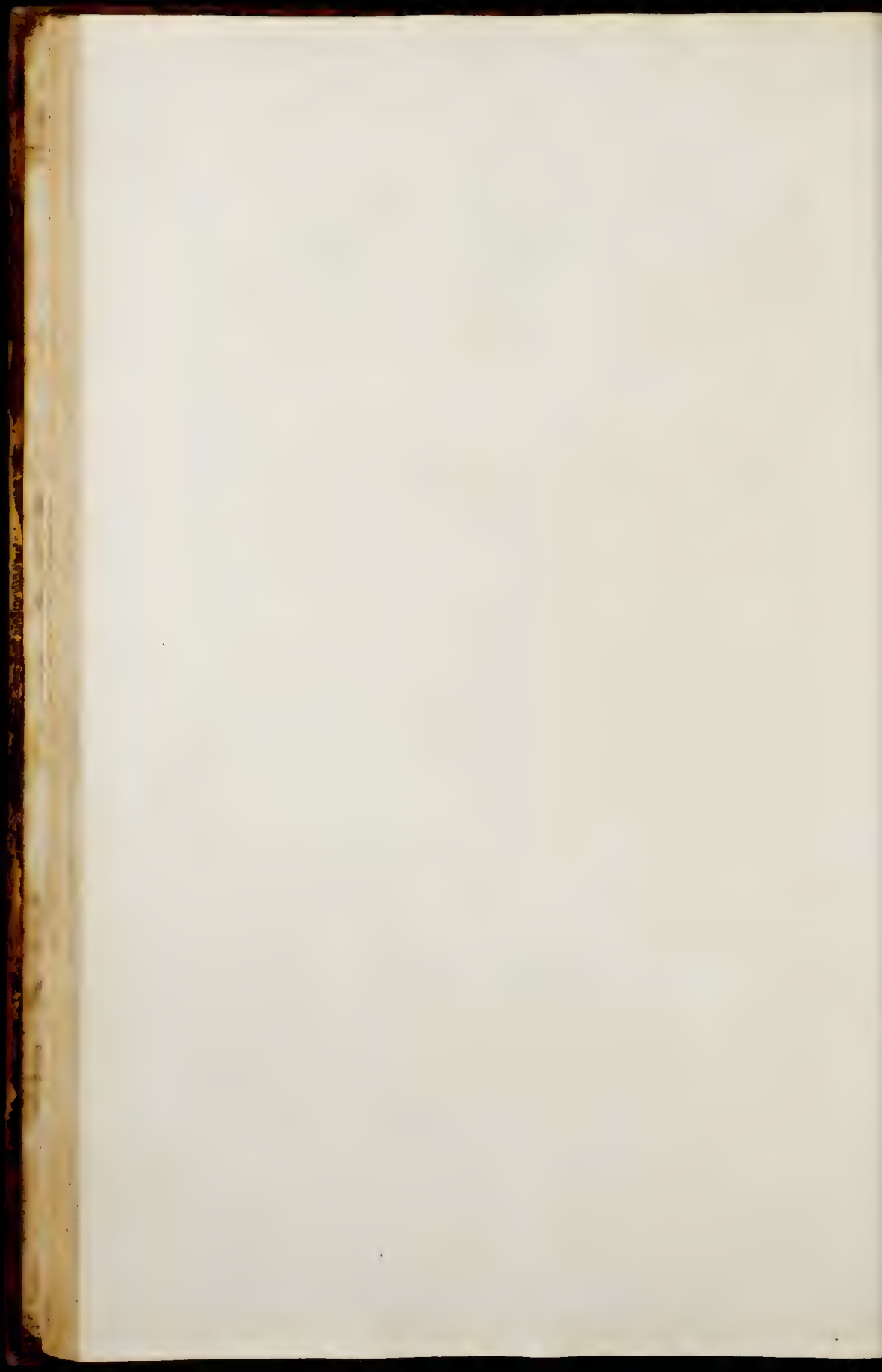


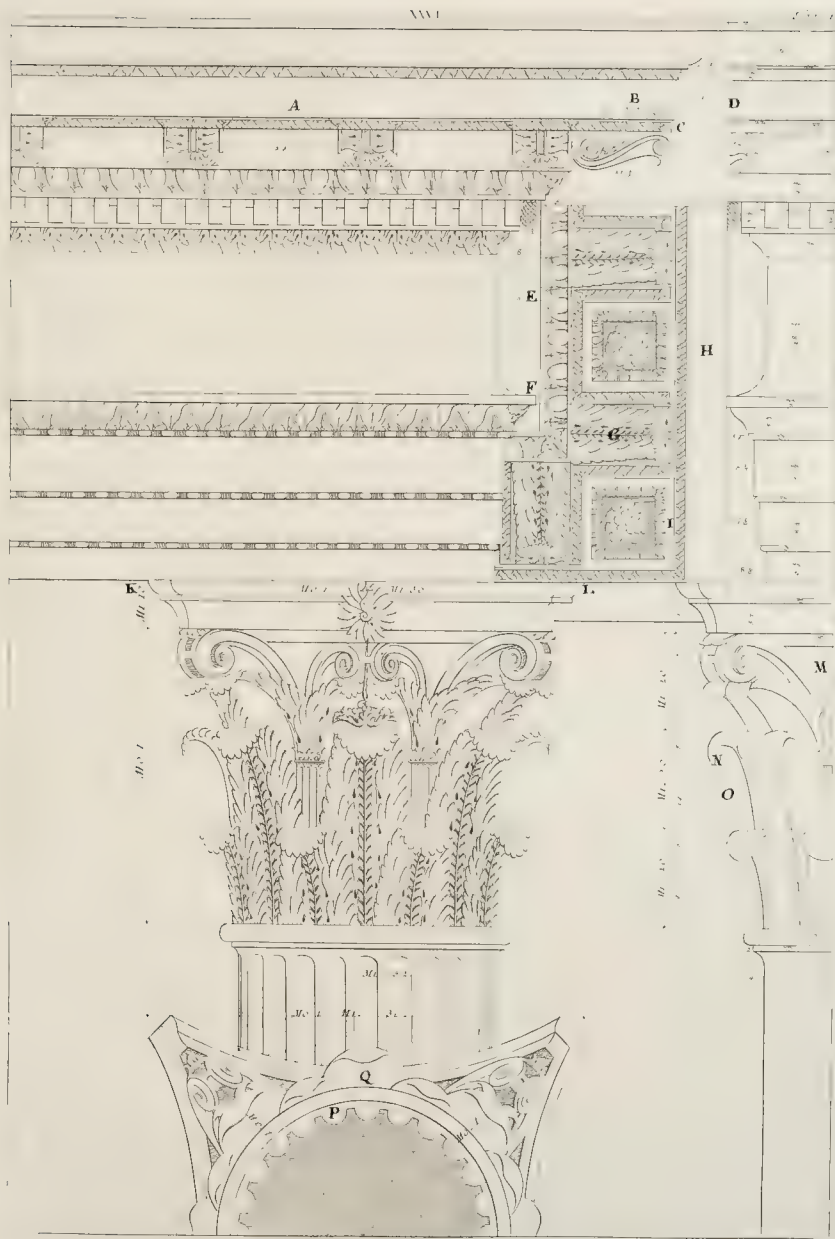




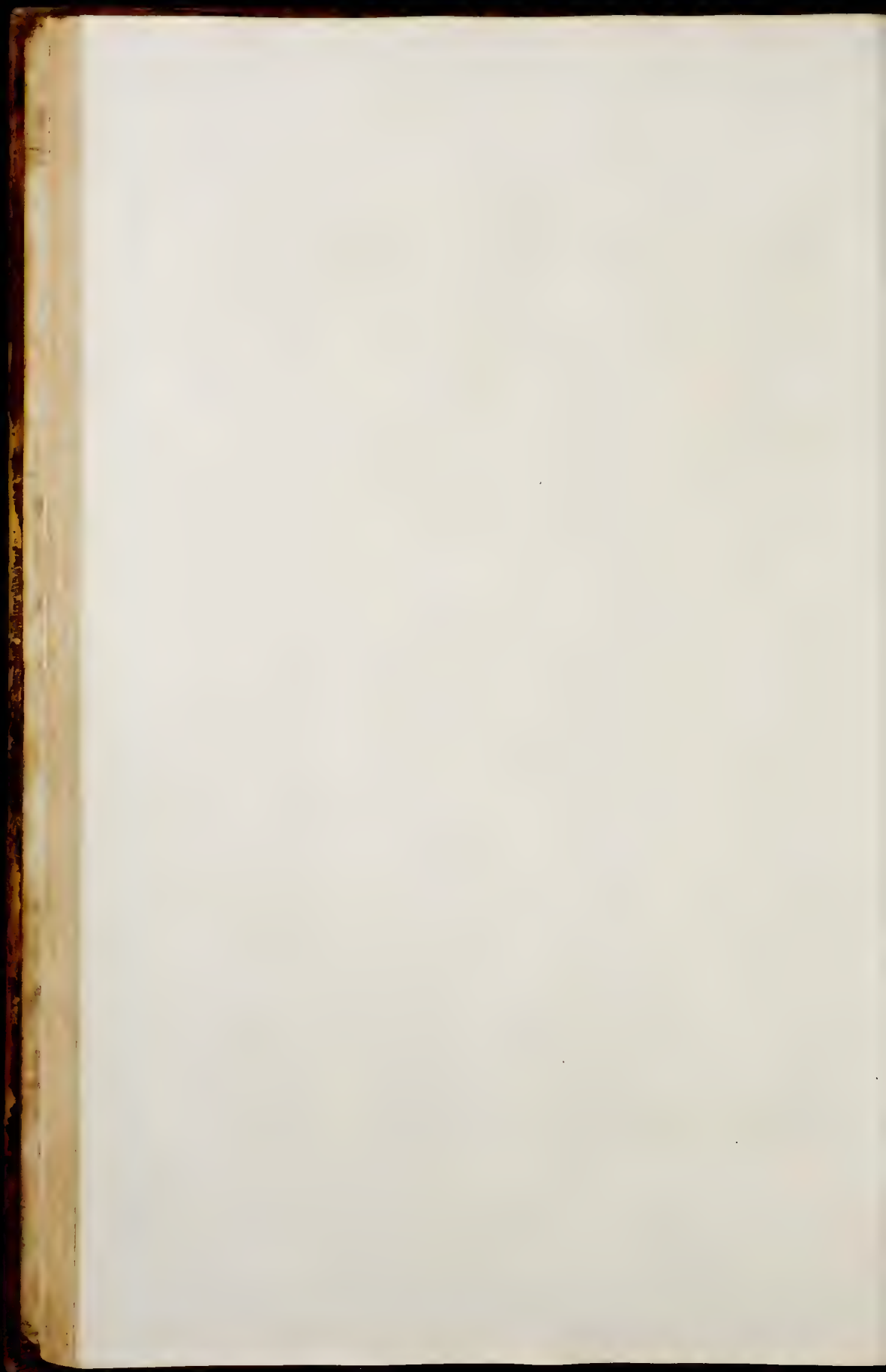






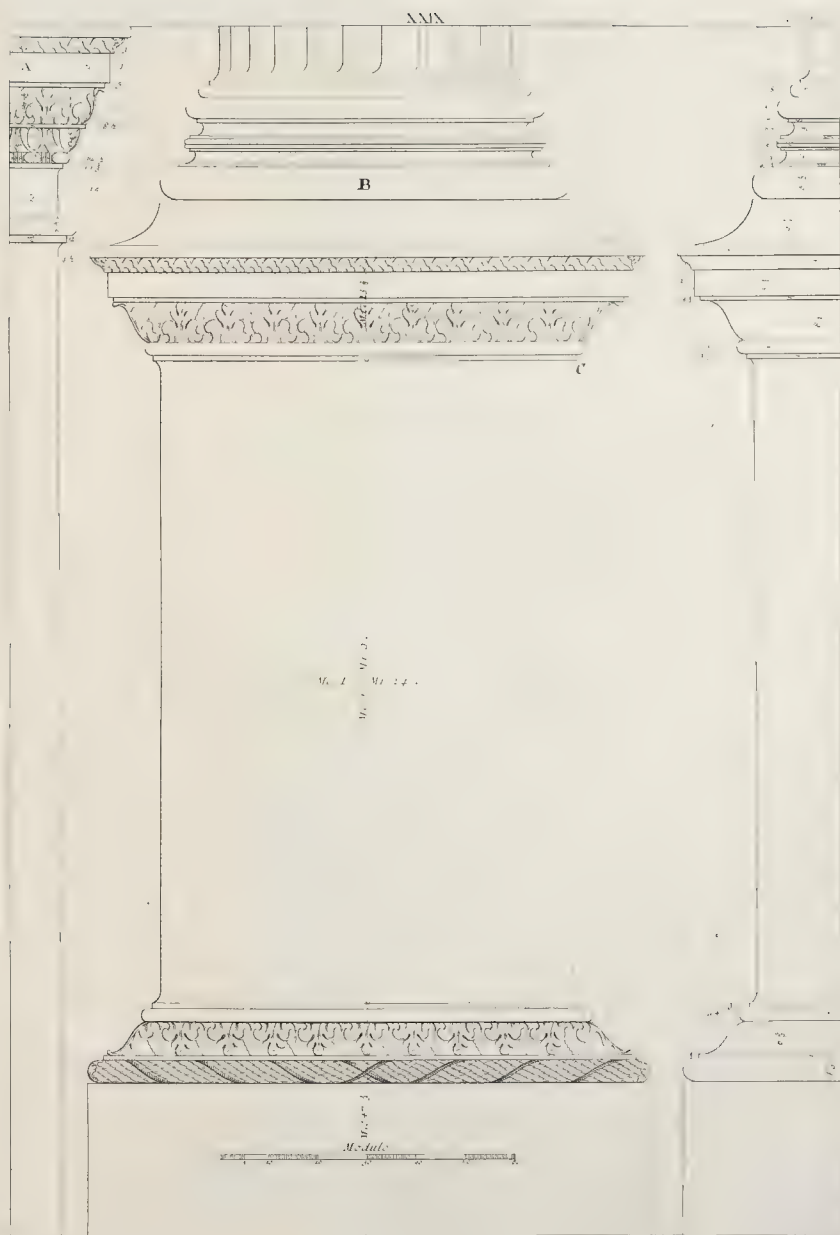




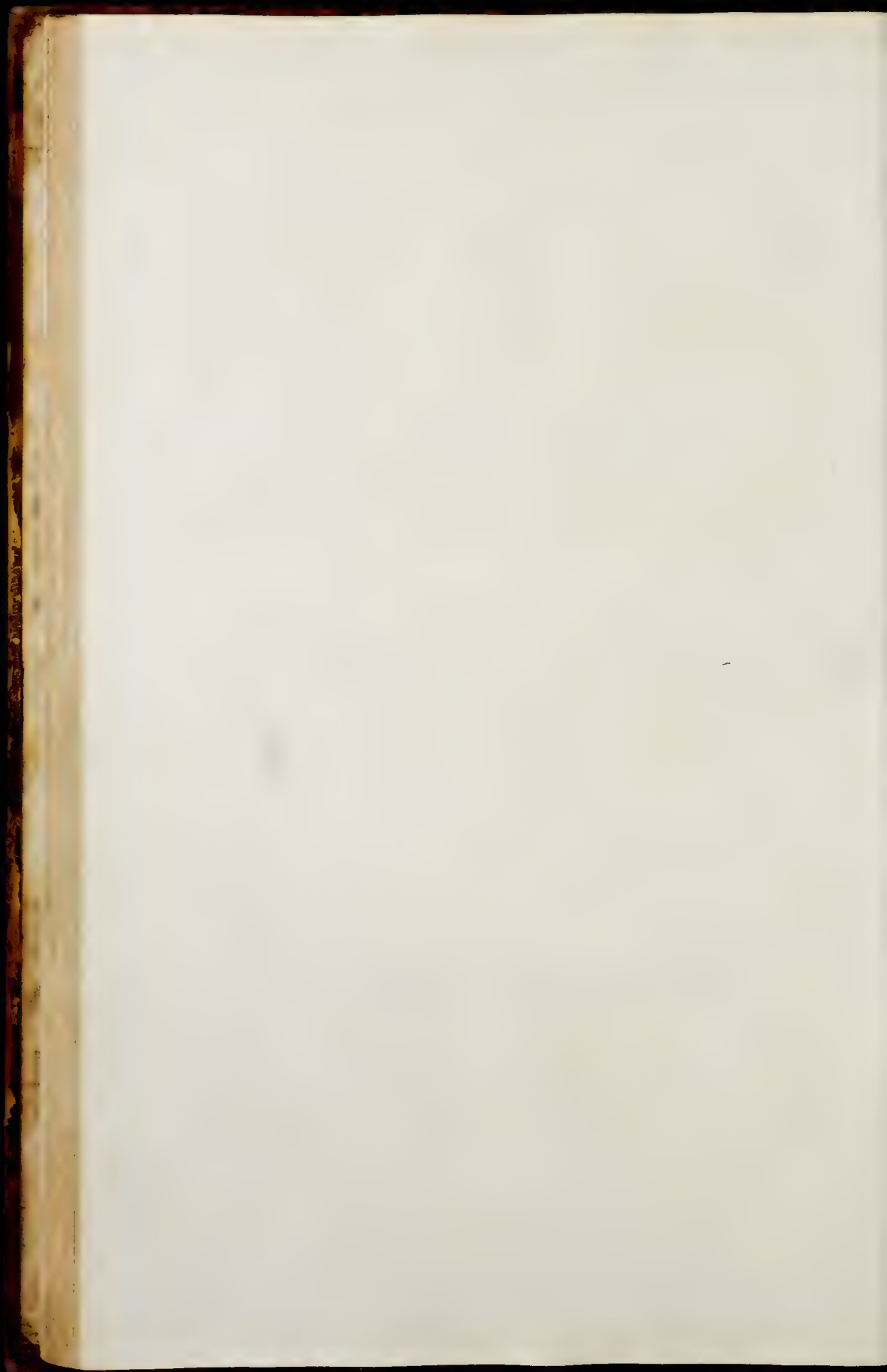


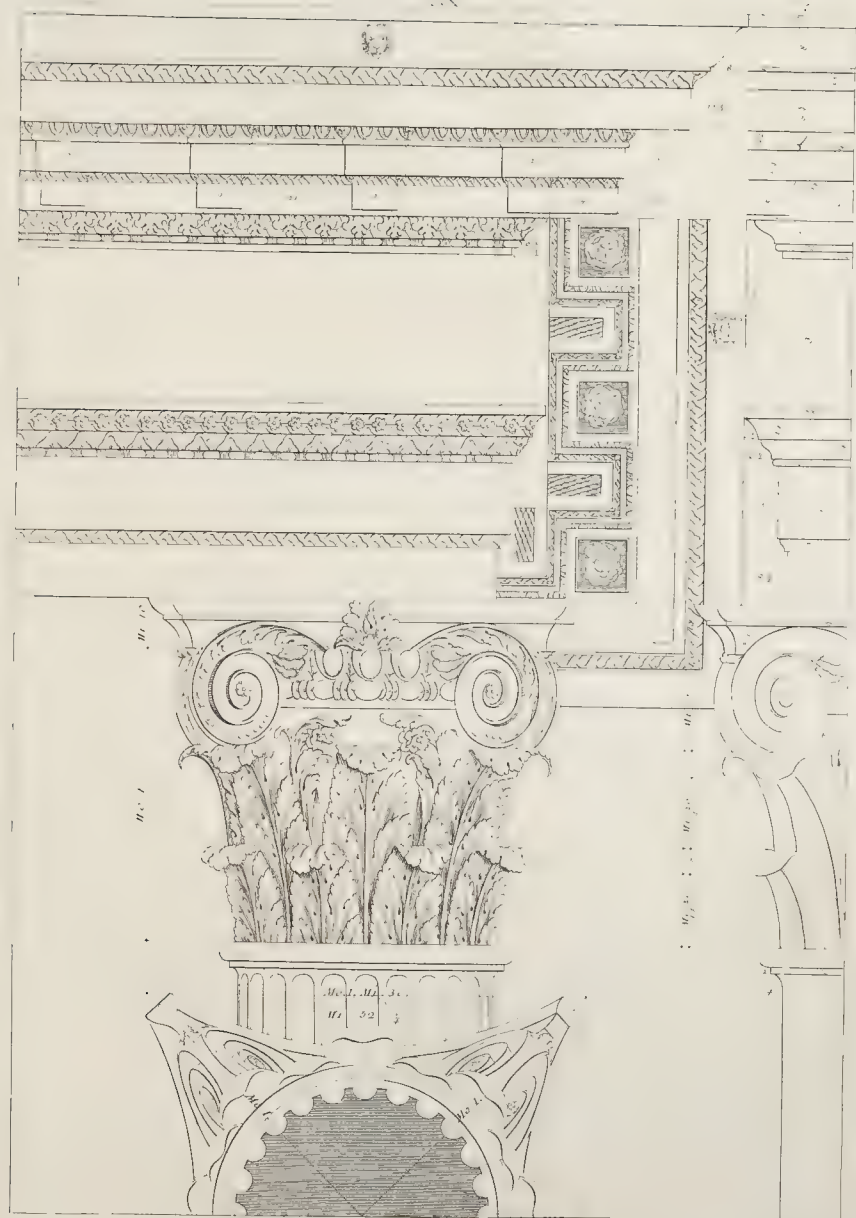


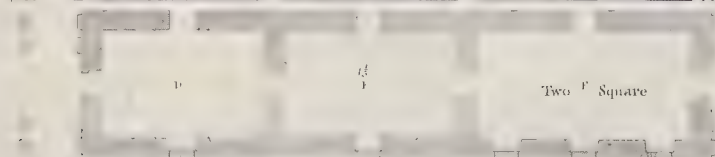
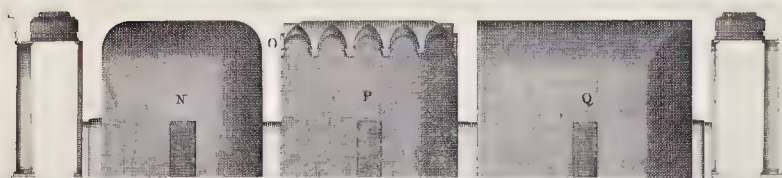
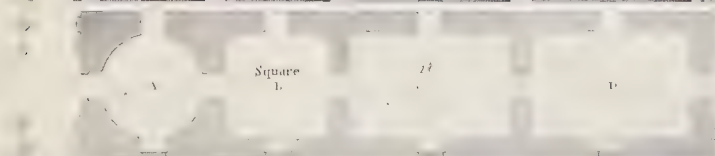
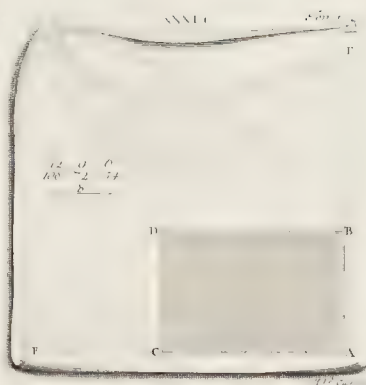
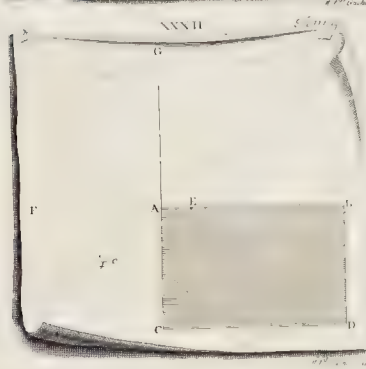
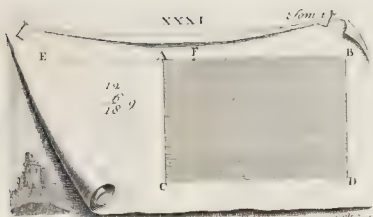


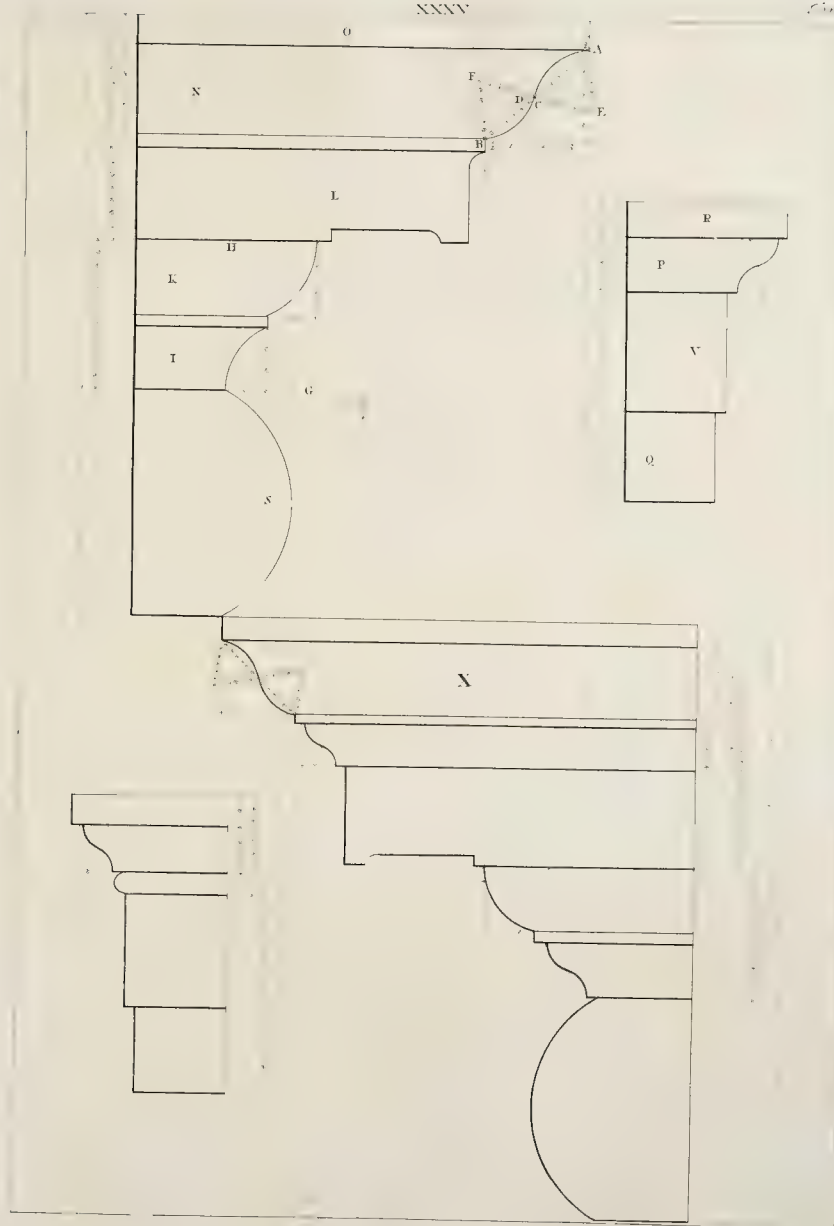


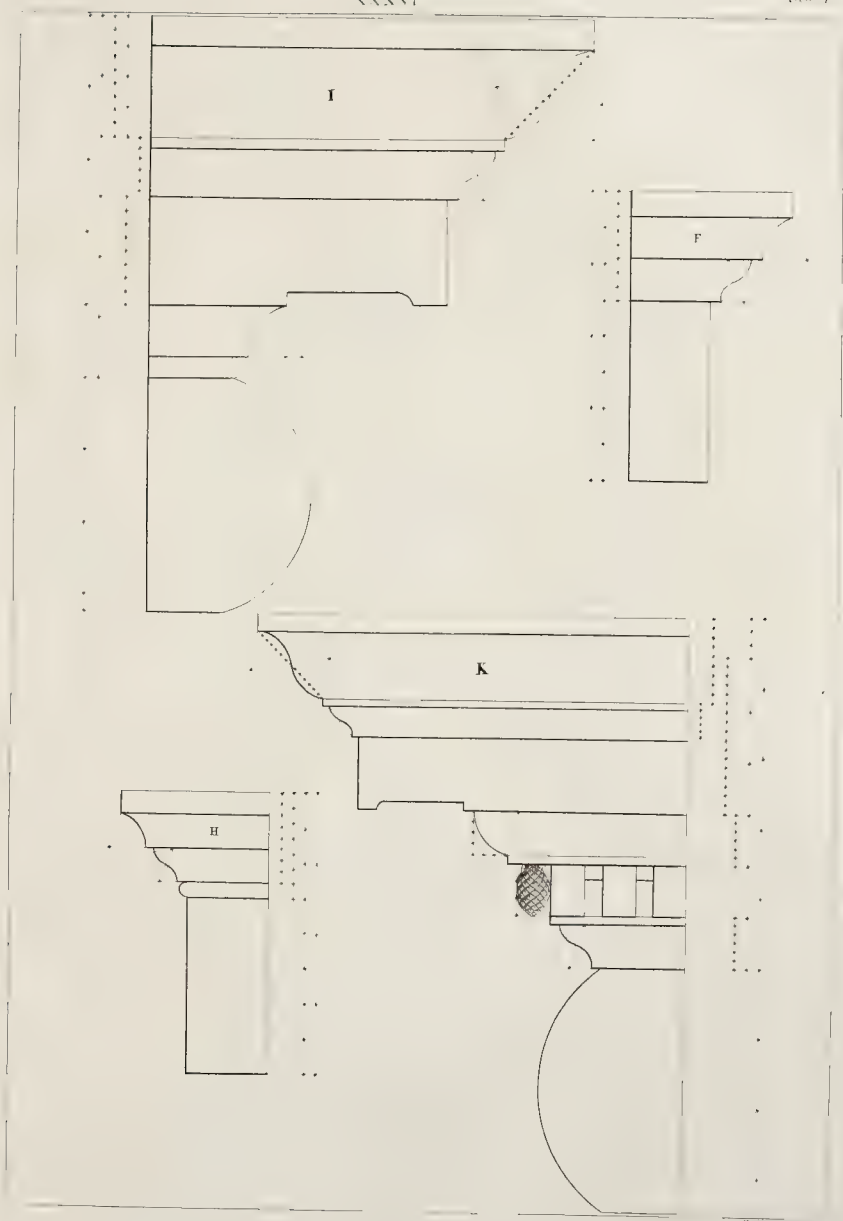
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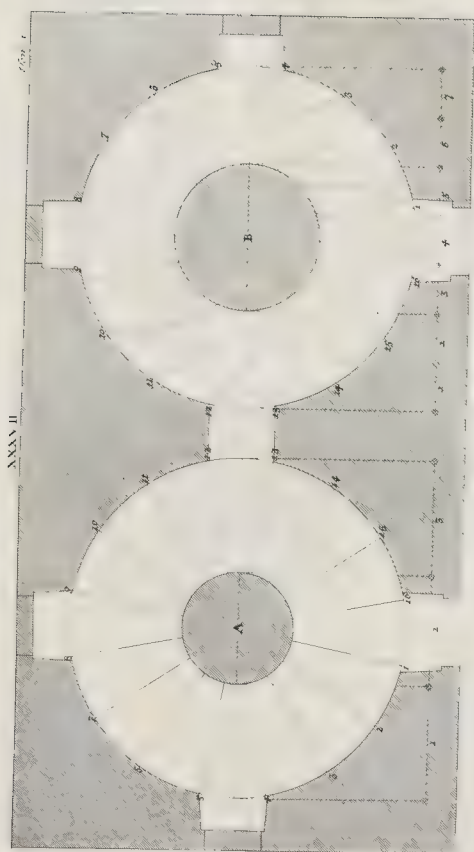


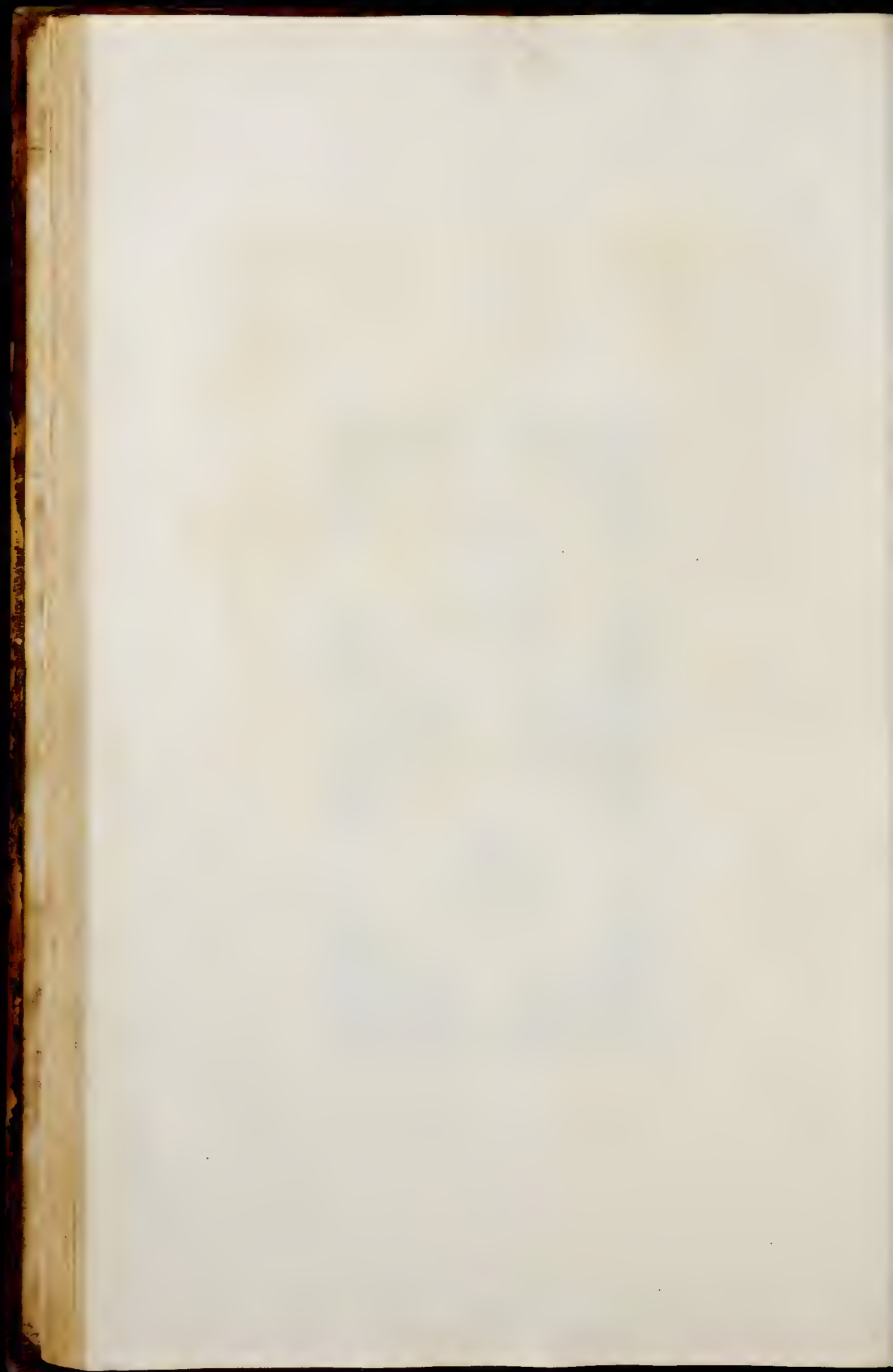


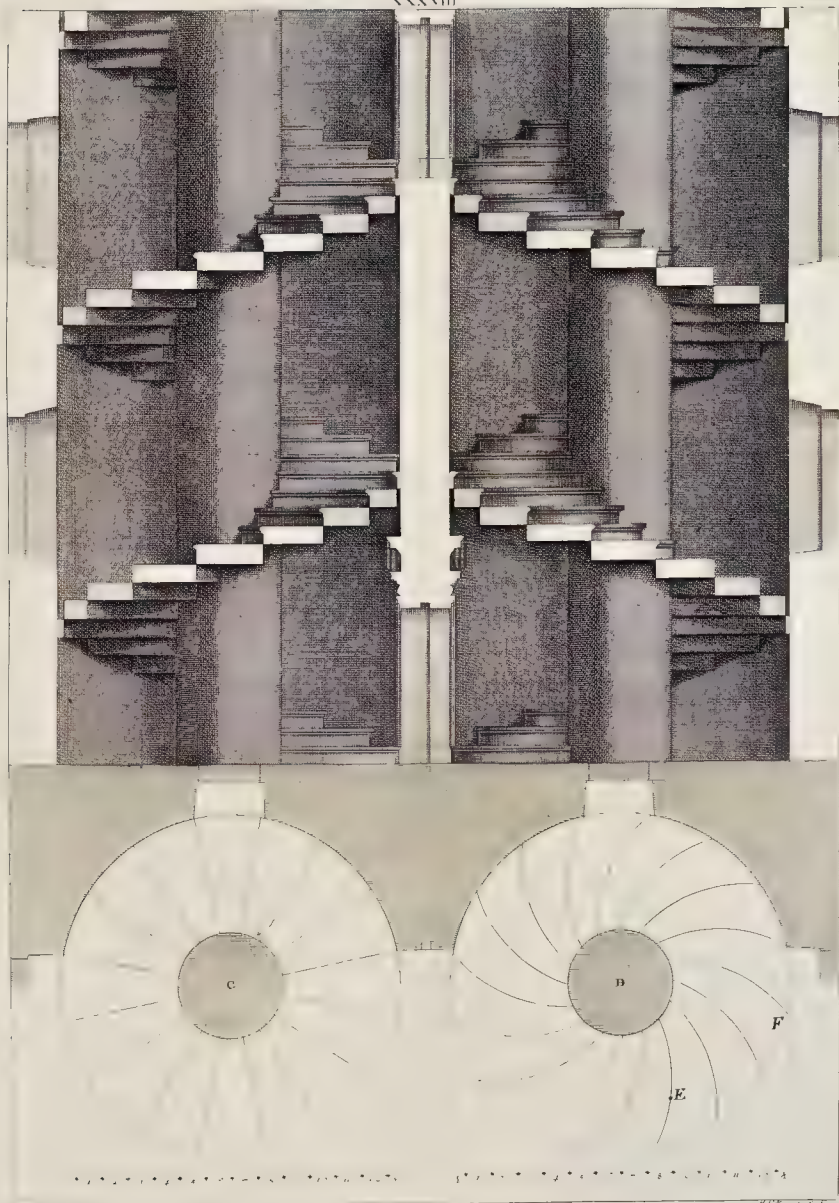


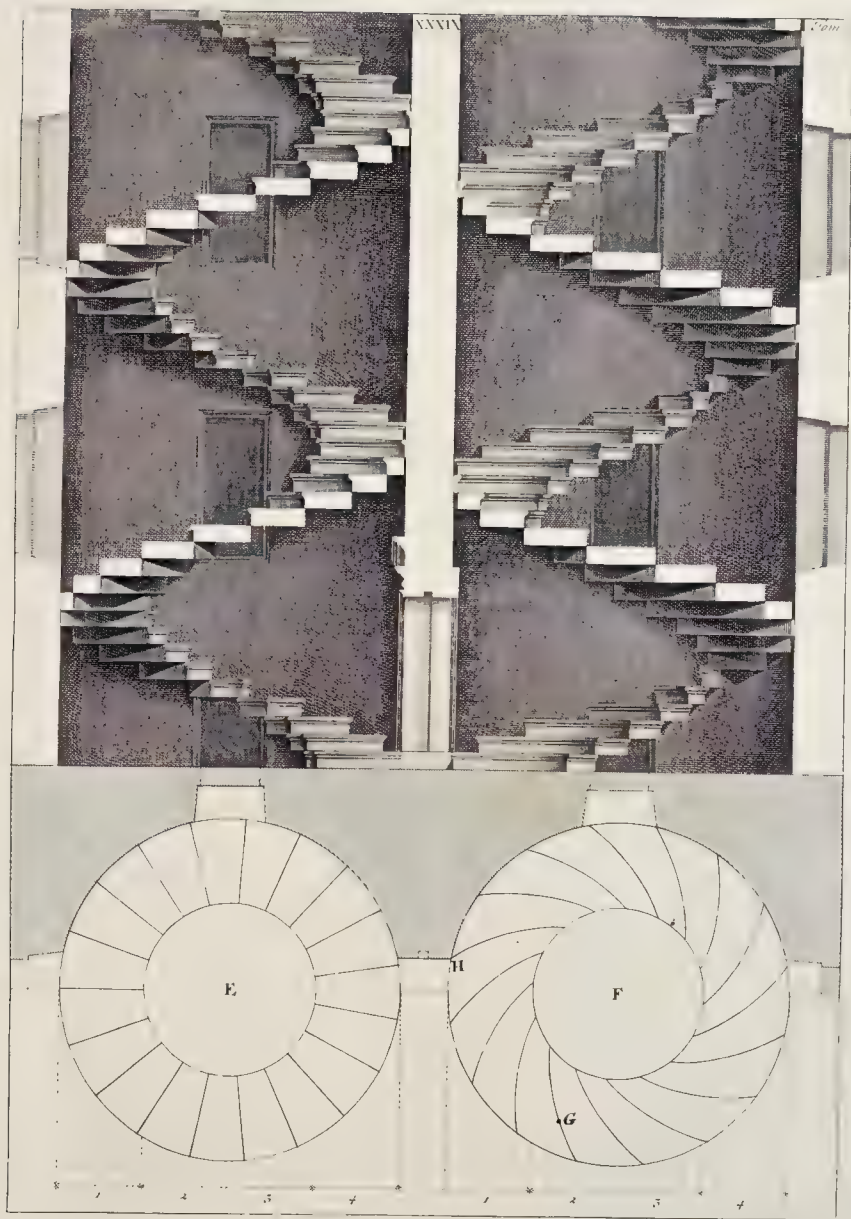


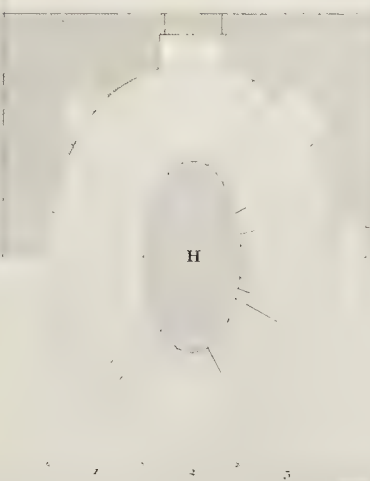
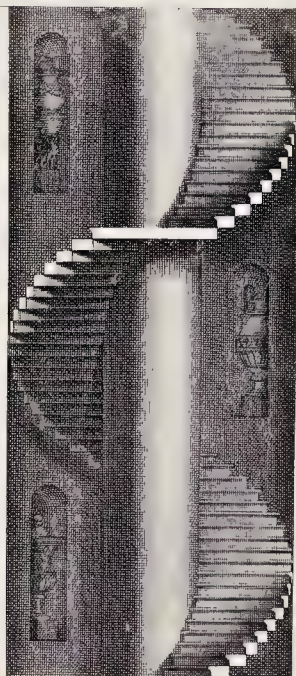
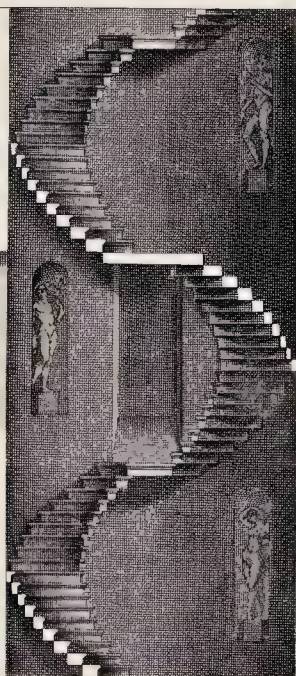


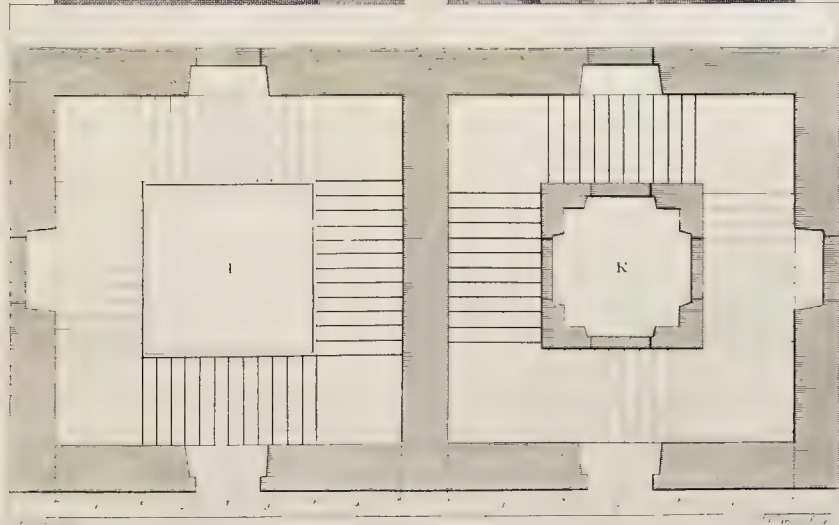
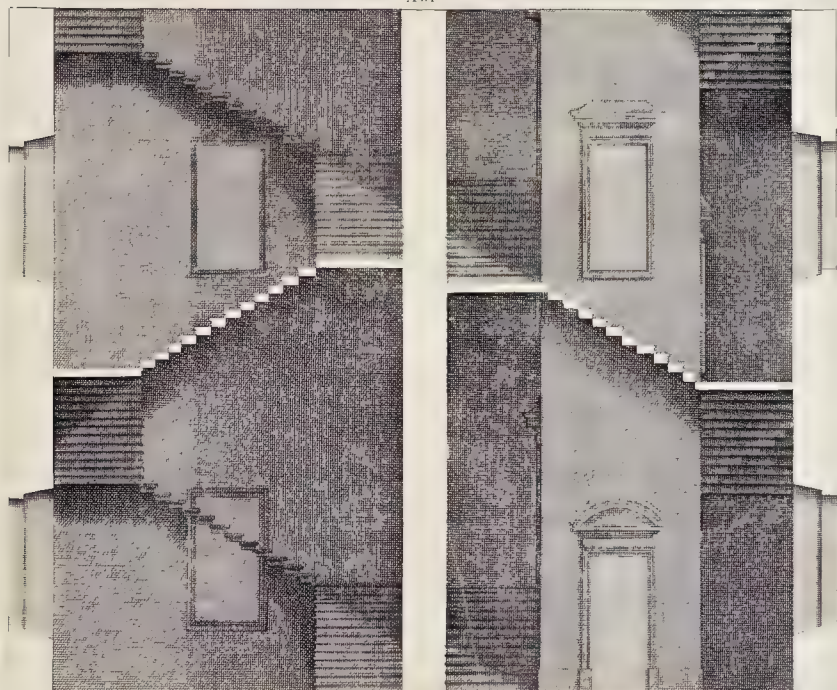


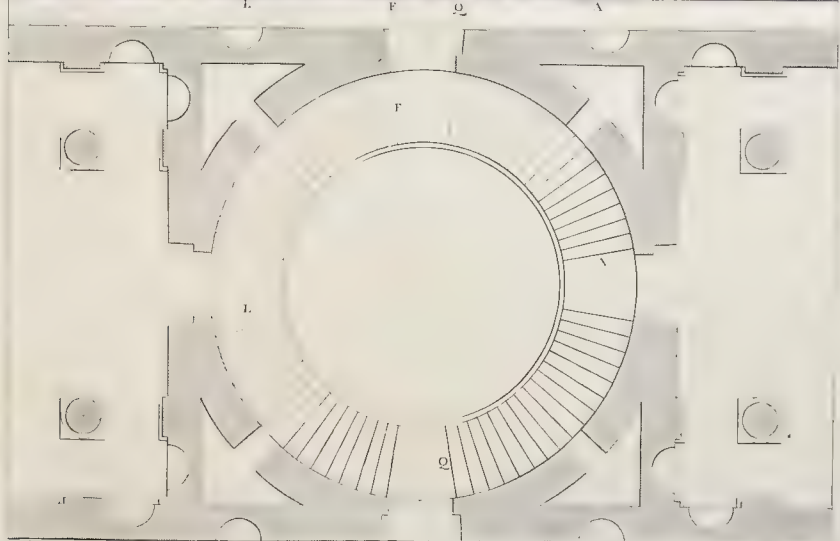
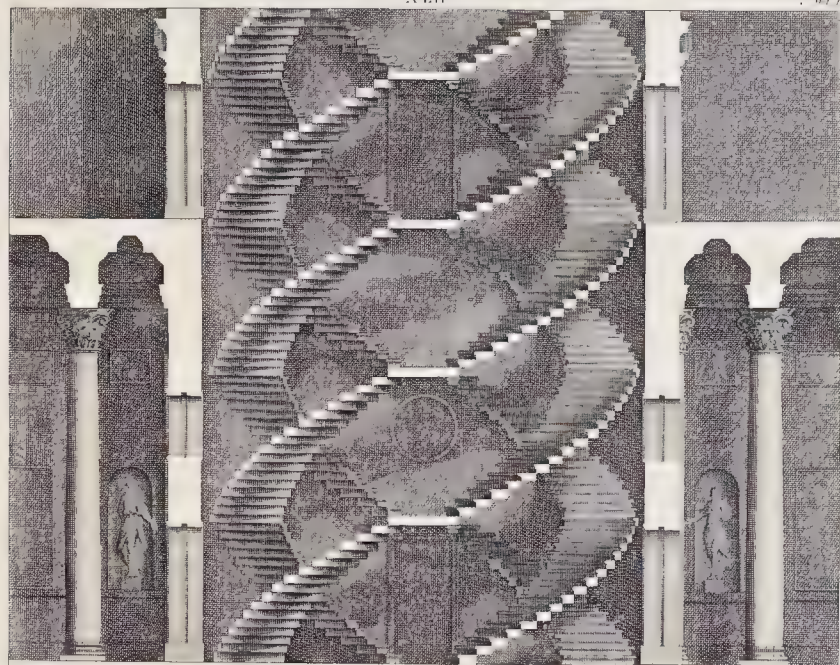


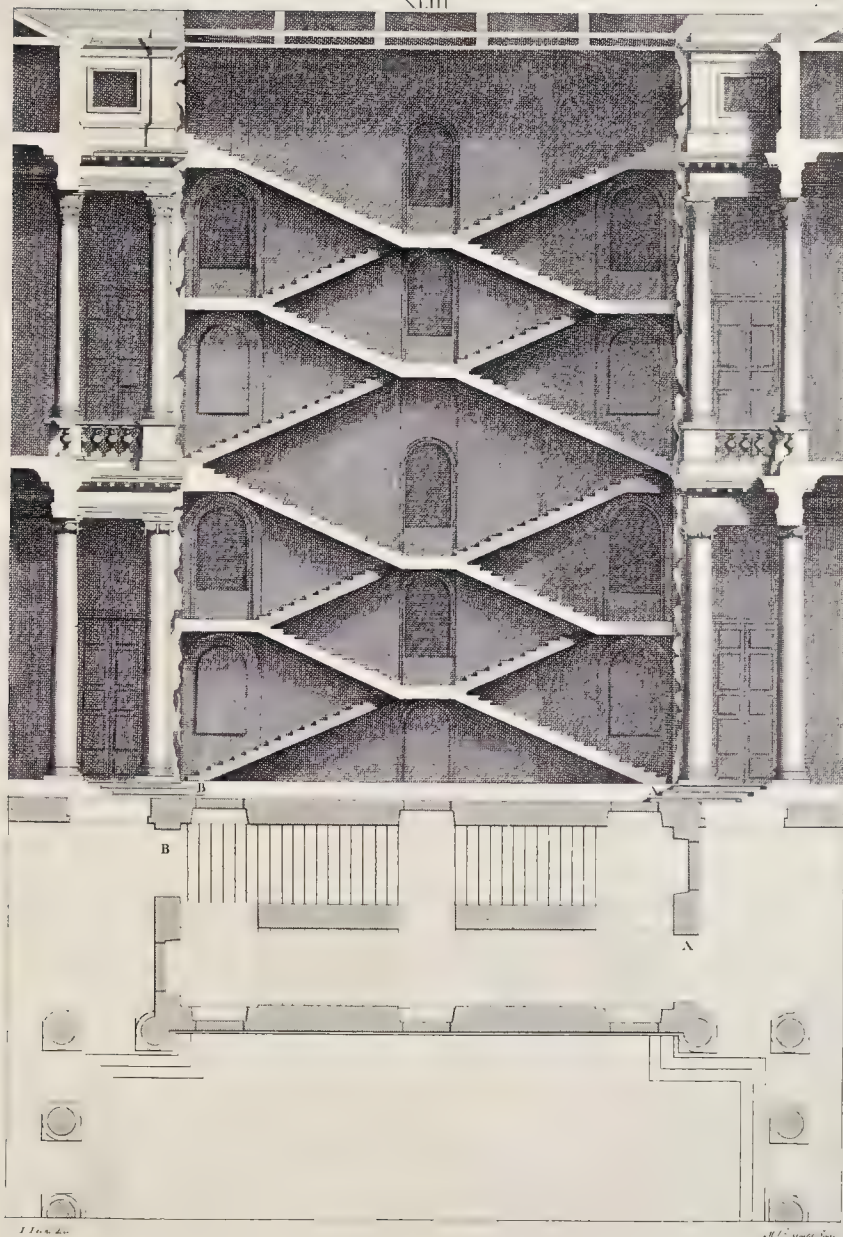












THE
ARCHITECTURE
OF
A. PALLADIO;
BOOK *the* SECOND.

CONTAINING

The DESIGNS of several Houses which he has
Built either in TOWN, or in the COUNTRY.

WITH

Some other DESIGNS of the Manner of Building among
the GREEKS and ROMANS.

Revis'd, Design'd, and Publish'd

By GIACOMO LEONI, a Venetian, *Architect* to His most
SERENE HIGHNESS, the Late

ELECTOR PALATINE.

Translated from the ITALIAN Original.

With NOTES, by INIGO JONES.



M. DCC. XLII.

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THE
HISTORY OF THE
CITY OF BOSTON

FROM THE FIRST SETTLEMENT
TO THE PRESENT TIME
BY
JOHN HUTCHINGS

IN TWO VOLUMES.
VOL. I.

BOSTON:
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JOHN HUTCHINGS

AT THE
PRINTING OFFICE OF
JOHN HUTCHINGS

NO. 10, NASSAU ST.

BOSTON.

1847.

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T H E
S E C O N D B O O K.

C H A P. I.

*Of the good Grace, Suitableness, and Proportion which ought to be
observed in private Buildings.*

I HAVE treated in the foregoing Book of all those things which I thought most necessary to be observed in the construction of public and private Buildings, in order to make them beautiful, convenient, and durable. I have also said something about the Conveniencies of private Gentlemen's Houses, of which I particularly design to speak in this second Book.

AND because we commonly call a House convenient, when it is suitable to the quality of its Master, and that all the parts of it not only have a proportion answerable to the whole, but also an exact symmetry each with one another; an Architect therefore must chiefly observe, what *Vitruvius* recommends in his first and sixth Books, *viz.* that when he builds for Persons of Quality, and more especially for those that are in publick Employment, he must build their Palaces with Portico's, Galleries, and large stately Halls richly adorn'd: that those who come for business, or to pay their respects to the Owner, may be received commodiously, and delighted and amused whilst they wait for him. But for those of a meaner Station, there must be a medium observ'd, as well in the size and form of the Building, as in the Ornaments and Expence. Judges and Counsellors Houses must also have places fit to walk in, and where their Clients may wait without being weary. Those of Merchants require Warehouses, and other places expos'd to the North, wherein they may keep their Goods and other Commodities; and those places must be so disposed, that the Masters may have no occasion to fear Thieves coming at them. One must also observe such a proportion, that every Member of the Building may agree with the whole; so that either in great, small, or ordinary Buildings, one may observe the parts to be great, small, or ordinary, suitable to their several Extents. For without doubt it would be a great fault, and a thing very disagreeable, if in a large Edifice all the Halls and Rooms were small; or if in a small House, two or three great Rooms should take up the whole. One must then (as I said just now) have regard, as much as possible, to the quality of the Gentleman who builds, more than to his wealth, and make him a House suitable to his quality: which being agreed upon, the parts of the Building must be so adjust'd, that they all may agree with the whole, and every one with each other, with such Ornaments as are suitable to them. But it frequently so happens, that the Architect is obliged rather to follow the fancy of him who intends to build, than those Considerations which his Art and Judgment dictate to him.

C H A P. II.

Of the Compartition or Distribution of Chambers and other Places.

TO make Houfes convenient for a Family, (without which they cannot be approved of by any body) one muſt take a great deal of care, not only in what concerns the chief parts of them, *viz.* the Entries, Halls, Courts, great Rooms, light Stair-caſes (ſpacious and eaſy to go up and down) but alſo that the meaneſt and leaſt beautiful of them may be ſituated commodiouſly to ſerve the other greater and more conſiderable Apartments. For in the ſame manner as we ſee in the human body, ſome noble and beautiful Members, and others again as diſagreeable and ugly, which laſt are nevertheleſs very uſeful to the firſt, and without which they could not ſubſiſt; ſo ſome parts of a Building muſt make a fine and noble appearance, and ſome others be leſs beautiful and elegant, without which the chief ones could not be diſtinguiſhed, but rather loſe a part of their dignity and perfection. But as our bleſſed Lord has ordered our Members, ſo as to make the fineſt of them to be the moſt expoſ'd to ſight, and concealing them that are not ſeemingly ſo: juſt ſo we muſt contrive a Building in ſuch a manner, that the fineſt and moſt noble parts of it be the moſt expoſed to publick view, and the leſs agreeable diſpoſed in by-places, and removed from ſight as much as poſſible; becauſe thither ought to be carry'd the reſide of the Houſe, and whatever may produce any ill effect or embarraſſment. For this reaſon I approve, that the Cellars, Wood-houſes, Pantries, Kitchen, Servants Halls, Landries, Ovens, and other Offices which are continually uſed, ſhould be placed in the lower part of the Building, and which I commonly order a little under ground. This diſtribution has two advantages: the firſt is, that the Apartment above is altogether free from the ſaid Incumbrances; and the ſecond, which is of no leſs conſequence than the former, is, that the ſaid Apartment is thereby much wholeſomer, its Floor being free from the moiſture of the Ground, beſides that its being high renders it more graceful, and contributes to a better proſpect. Care muſt be taken next, that in the reſt of the Building there be large, middle-ſiz'd, and ſmall Rooms; and that they be all near one another, for the better Communication between them. Convenient Partitions muſt be alſo contriv'd for Cloſets, Libraries, Horſe-Furniture, and to put out of the way other things which one may have daily occaſion for, and which would appear very unſeemly in a Bed-chamber, Dining-room, or place where Strangers are receiv'd. It is alſo convenient that the Summer-rooms be large and ſpacious, and open to the North; and the Winter ones ſmaller and open to the South and Weſt; becauſe that in Summer we ſeek the Air and Shade, and that in Winter we ſeek the Sun, as well as by reaſon little Rooms are eaſier warm'd than larger ones. But the Rooms deſign'd for Spring and Autumn ſhould look towards the Eaſt, and have their proſpect towards Greens and Gardens. Studies and Cloſets muſt alſo have the ſame proſpect, becauſe the Morning is the beſt time of reſorting to ſuch places. All the Rooms in general, either large, middle ſized, or ſmall, ought to be ſo order'd or contriv'd, that (as I have already ſaid) every part of the Building may correſpond one with the other, and the whole frame ſhew ſuch a convenience and ſymmetry between all its parts, as may render it handſome and agreeable. But becauſe it moſt commonly happens

happens that in Cities, either the Party-walls, the Streets, or publick Places confine and restrain an Architect within certain bounds, beyond which he has not the liberty to go; therefore necessity compels him to suit himself with the place according to its Situation: and on those occasions, if I am not mistaken, one may receive some benefit from the Plans and Elevations I am now going to give; which may also serve as Examples for what I have already said in my first Book.

* THIS Plate represents half a *Vicentine Foot*, half a *French Foot*, and half an *English Foot*.

ALL the following draughts have been made and measured according to the *Vicentine Foot*, which is here divided into 12 Inches, and every Inch into 12 parts, as are also the *French* and *English Foot*.

IV. B. THAT the *French Foot*, commonly called *Pié de Roy*, is equal to 11 Inches of the *Vicentine Foot*, and the *English* one makes only 10 Inches one quarter of the same.

C H A P. III.

Of the Construction of Houses in Towns.

I AM sure that they, who shall look upon the Buildings I am going to give the draughts of in this Book, and they, who know how hard it is to introduce a new way, particularly into the Art of Building (in which every one presumes to be knowing) will think me very happy, that I have met with Persons who were generous, judicious, and reasonable enough to hear and approve my Reasons; and afterwards to give over that old way of Building, which is without any proportion or grace at all: and indeed I own it as a particular favour God has done me amongst many others, to give me an opportunity of putting several things in practice, which I had learnt by a very laborious Examen and long Study. And tho' among those very Buildings some have remain'd unfinished, yet it is very easy to judge by what is done, what the whole would have been. I have put the names of the Owners, and the places where the Buildings are situated, to their Draughts; that they who have a mind, may see how they have succeeded in the performance. After this I think it very proper to acquaint the Reader, that I have had no regard to the Rank or Quality of the Persons in the order of my Draughts; for they are every one of great Quality and Honour, and I placed them only as they came first to my Memory.

BUT it is now time to come to our Buildings, the first of which is at † *Udene*, the Metropolis of *Friuli*. It was built from the Foundations by Signior *Floriano Antonini*, a Gentleman of the same Town. The Ground-floor Wall of the forefront is Rustick; and the Columns of the Vestibule and Gallery backwards are Ionick. The first Chambers are arched; and the Arches of the largest are made according to the first method I spoke of, concerning the Arches or Vaults that are in places longer than broad. The Chambers of the second Story are ceild, and are a little broader than the lower ones, because of the diminution of the Walls; the height of the Ceilings being equal to their breadth. There are other Chambers higher, that may serve for Garrets. The Hall is so high that it reaches to the very Roof. The Kitchen is separated from the body of the House; but for all that it's very convenient. Near the great Stairs is the House of Office,

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which

* Plate I. † Plate II.

which tho' in the body of the House, does not give any ill smell, being in a place whereon the Sun does not shine, and having vents made in the thickness of the Wall from the bottom of the Pit to the very top of the House, through which the offensive smell is evaporated.

AT *Vicenza*, on the place vulgarly call'd the Isle, Count *Valerio Chiericato*, an honourable Knight of the same Town, caused the following design * to be executed. This Building has a great Portico or Gallery in the lower part, that takes up the whole fore-front of it. The Base of the first Order is five foot above the ground, which is so disposed that the Cellars may be underneath it, as also all the other Offices intended for the conveniency of the House; which had not succeeded so well, were they quite under ground; because of the neighbourhood of the River, and that thereby the upper Stories should be more airy, and have a far better prospect. The Vaults or Arches of the great Rooms are raised according to our first method, or first rate of Arches: the lesser ones are arch'd shell-like, and are as high as those of the largest sort: the Closets are also arched, and have Mezzanino's or half Stories above them. Every Arch is adorn'd with compartments of Fret-work curiously wrought by *Bartolomeo Ridolfi*, a Sculptor of *Verona*, with several excellent pieces of Painting done by Messer *Domenico Rizzo*, and Messer *Battista Venetiano*, men very famous in those Professions. The Hall is in the middle of the Fore-front above, and occupies the middle of the Gallery beneath. Its height reaches to the Roof of the House, and because it projects a little outwards, its Angles are supported by double Columns. On each side of this Hall are Galleries, the Cielings of which are adorn'd with Pictures that are extremely fine, and make a glorious show. The first order of the Fore-front is Dorick, and the second Ionick. This following design † represents part of the Fore-front enlarg'd.

THE next draughts ** are of Count *Isseppo de Porti's* House, a noble Family in the same City. This Building fronts two large Streets, and therefore has two Entries or Vestibules with four Columns each, which bear an Arch to secure the superincumbent weight. The Rooms of the first Story are arch'd; the height of those on the sides of the Vestibule are after our second method of Arches. The Rooms of the second order are ceil'd, and all painted, as well as those of the first Story, and set off with very rich Ornaments of Fret-work, made by those Artists we spoke of before; and the Pictures are made by *Paul Veronese* a most famous Painter. From each of these Entries one may go through a Passage into a Court that is to be surrounded with a Portico; the Pillars of which are $36\frac{1}{2}$ Foot high, which is the whole height of the first and second Stories. Behind these Columns are Pilasters that are one Foot and 9 Inches diameter, and they project outwards $\frac{2}{3}$, supporting the Pavement of the upper Gallery. This Court divides the whole House into two parts. The fore part is for the Master and his Women, and the back part is design'd for the reception of Strangers: that the one and the other may pass to and fro with more freedom, a thing to which the Ancients, and particularly the *Grecians* had a special regard. And moreover this way of dividing a House may be also very convenient, in case the Children or any of the Family should require private Apartments. I placed the principal Stair-cases under the Portico, which is just opposite to the middle of the Court; that those who go up and down may necessarily have a prospect of the most beautiful part of the House, and that being in the middle, they may serve the two separate

* Plate III. † Plate IV. ** Plate V.

separate parts of the Fabrick. The Cellars and other Offices are under ground. The Stables are separate from the body of the House, and have their Entries under the Stair-cases.

* THE first of the two great draughts represents a part of the fore-front; and the second, that side that fronts the Court.

† THE following House is at *Verona*, which was begun by Count *Gianni Battista della Torre*, a Gentleman of the same City, whose Death put a stop to its finishing, tho' it was very far advanced. The Entries are by the sides of it, where there are passages ten Foot broad, which lead to the Courts fifty Foot long, and from thence to an open Hall, adorn'd with four Columns, which serve also to support securely the upper Hall. This same Hall leads to the Stair-case, which is of an elliptical form, and open in the middle. The said Courts are surrounded with Ballustrades, that are level with the second Floor. The other private Stairs serve for a greater Convenience throughout the whole House. This Compartment succeeds extraordinary well in its Situation, which is long and narrow, and one of the Wings fronting the principal Street of the City.

** THE following is the draught of a Building at *Vicenza*, belonging to Count *Ottaviano de Thieni*, and was begun by Count *Marc Antonia*. This House being situated in the heart of the Town, near the Market-place, I thought it was very proper to leave room for Shops on that side which fronts the Market; the Architect being oblig'd to have some regard for the advantage of those that are at the expence of the Building, when the extent of the Ground will conveniently allow it. Every Shop has over it a half Story for the use of the Shop-keeper, and over these are the Master's Apartments. This House, as one may say, stands in an Island, being surrounded by four Streets. The chief Entry, or Master-gate (as we may speak) has a Gallery before it, and fronts the principal Street of the Town. The great Hall is to be above it, and will project as far out as the Piazza underneath. In the two Wings are two other Entries with Columns in the middle, which serve rather to strengthen the upper part, and render its breadth proportionable to its height, than for bare Ornament. By these Entries one passes to a Court surrounded with a Piazza, of which the first Row of Pilasters are Rustick, and the second row of the Composite order. The Rooms at the four corners are octangular, and have a good effect, both for their beauty, and the several conveniencies to which they may serve. The Chambers that are now finish'd have been adorn'd with very fine Stuccatures made by Messer *Alessandro Vittoria*, and Messer *Bartolomeo Ridolfi*, and painted by *Anselmo Canera*, and *Bernardino India*, both of *Verona*, and not inferior to the best Masters in their profession. The Cellars and such like places are under Ground, because the Building is situated in the highest part of the Town, where there is no great fear of Water.

†† THE first of the two great draughts following represents a part of the Fore-front of the House, the second that side which fronts the Court.

THE Counts *Valmarana*, of a most noble Family of the same place, have also built according to the following designs *†, not only for their own honour and convenience, but also for the ornament and glory of their Country. They have left nothing wanting which may be desir'd in the enriching of such a Building either for Stuccature or Painting. This House is divided into two parts by a Court in the middle, about which there is a Corridor with Ballusters, which leads from the fore-part of the House to that which is behind the Court. The Chambers of the first Floor are arch'd; and the upper ones are ceil'd, of which the height

is

* Plate VI. and VII. † Plate VIII. ** Plate IX. †† Plate X. and XI. *† Plate XII.

is equal to their breadth. The Garden before the Stables is 120 Foot long by 60 Foot wide. I think this description is sufficient for what concerns this House, all the rest being easily seen in the Plan of it, where I have set down the measure and size of every part, in the same manner as in the foregoing ones.

* THE draught that follows is one half of the fore-front on a large Scale.

AMONGST several worthy Gentlemen of *Vicenza*, there is Signor *Paolo Armerico*, who was Referendary to the Popes *Pius* the fourth and fifth, and deserv'd to be made a Citizen of *Rome*; as well as all his Family for his sake. This Gentleman after having travel'd a long time to improve himself, being come to settle at last in his own Country, after the death of all his Friends, chose his abode at a Country-house he had on a Hill, within less than half a Mile of the Town, where he since has built the following House †, which I have not placed among the Country-houses, because of its proximity to the Town, to which one may properly say it belongs. Its Situation is as advantageous and delicious as can be desir'd, being seated on a hillock of a most easy ascent, at the foot of which runs the *Bacchiglione*, a navigable River. On the other side, it is surrounded by several Hills, that seem to form a great Theatre, and which besides are all of them cultivated, being very fertile, abounding with excellent Fruits and Vineyards: so that having the advantage of fine Prospects on all sides, some confin'd, some more remote, and some farther than the sight can reach, I have made Portico's to all the fore-fronts; under the which, and also of the Hall, I have contriv'd Rooms for the use and conveniency of those of the Family. The Hall which is circular, and placed in the middle of the Building, receives its Light from the top. The Closets have *Mezzanino's*. Above the great Rooms surrounding the Hall (the Arches of which are after our first method) there is a Platform to walk on 15 $\frac{1}{2}$ Foot broad. On the Pedestals, which support the steps of the four Portico's, are Statues made by Mr. *Lorenzo Vicentino*, an excellent Sculptor.

SIGNOR *Guiglio Capra*, a worthy Gentleman of the same Town, for the honour of his Country rather than for his own conveniency, has made all the preparations necessary, and even begun to build the following design **, which is advantageously situated, in the principal Street of the Town. This Building is to have Courts, Galleries, Halls and Chambers of all sorts, some being large, some little, and others of a middle size. The form of it is beautiful and diversify'd, so that it will be magnificent and noble, suitable to the dignity and generosity of its Master.

C. *A little open Court.*

D. *Another little Court.*

L. *The great Court.*

S. *A Hall which is supported with Columns underneath, but having none above, makes it appear much lighter.*

COUNT *Montano Barbarano*, having a place to build on in *Vicenza*, desir'd me to give him the following design ††, which not suiting the place at first, I was obliged to make some Alterations in it; but that Gentleman having since bought the ground that was wanting, the first design has been entirely executed. The Stables and Servants Rooms on the one side answer to the Womens Apartment, to the Kitchen and other convenient Offices on the other side, as may be seen in the draught. This Building is so far advanc'd, that they are raising the Fore-front, which is made according to the following design in great *†. I could

* Plate XIII. † Plate XIV. and XV. ** Plate XVI. †† Plate XVII. *† Plate XVIII.

could not furnish the Printer soon enough with the plan of the last draught, according to which it was finally resolv'd to build it, and that the Foundations of it are already laid. The Entry has some Columns which support an Arch for the reasons before given. On each side there are two Chambers, which are a square and a half in length, at the end of which are two square ones, and after them two Closets. Opposite to the entry is a passage that leads to a Portico towards the Court. On each side of this same passage is a Closet with a *Mezzanino* above it, to which one goes by the principal Stair-case. All the Arches of these places are twenty one Foot and a half high. The Hall above, and all the other Rooms are ceil'd, except the Closets, which are arch'd as high as the Ceilings of the Rooms. The Columns of the fore-front have their Pedestals, and support a Corridor, to which one enters by the Soffit. The front is not to be after this first method, as I have said before, but as it is in the next design * drawn upon a larger Scale.

C H A P. IV.

Of the Tuscan Atrium, or Hall.

NOW that I have given the designs of some Houses I have erected in Cities, I think it proper to discharge my self of my promise, in describing some of the principal places of which the Houses of the Ancients were composed. I shall begin with the *Atrium*, as being one of the most principal parts, and come afterwards to the other adjoining parts of the said Buildings, and lastly to their common Halls. *Vitruvius* in his sixth Book observes that there were five sorts of these *Atriums* among the Ancients, *viz.* the *Tuscan*, that of four Columns, the *Corinthian*, the *Tetastadate*, and the open one, of which I intend not to speak. The following designs † are for the *Tuscan Atrium*. The breadth of this is equal to the two thirds of its length. The breadth of the Record-room is but two fifths of that of the *Atrium*, which is square. From this one passes into the *Peristylos*, which is a Court surrounded with Pilasters, a third longer than its breadth. The breadth of the Piazza or Portico (*that is, the space from the Wall to the Pillars*) is equal to the height of the Columns. Opposite to the wings of the *Atrium* one might contrive little Halls, having a prospect over the Gardens; and if they are made as they are represented in the draught, their Columns should be *Ionick*, about twenty Foot high, and then the Piazza's would be as broad as the distance between each Column. Above there should be some other Columns of the *Corinthian* Order, a fourth part less than those below, between whom there should be Windows to give light, in imitation of the *Corinthian* Halls, as one may see hereafter, Plate XXX. The opening above should be without any cover at all, and ought to be surrounded with a Ballustrade. If the ground will allow it, one may make more or less Lodging than I have here drawn, according as the use and convenience of the master shall require:

THE following draught ** upon a larger Scale represents this *Atrium*.

A. Atrium.

B. Door to the Record-room.

VOL. I.

P

C. Record-

* Plate XVIII. † Plate XIX. ** Plate XX.

- C. *Record-room.*
- D. *Portico of the Peristylos.*
- E. *Portico, or Gallery before the Atrium, which may be called the Vestibule.*
- F. *Freeze and Cornice on the Breast-summer, supporting the top of the Atrium.*

C H A P. V.

Of the Atrium with four Columns.

THE following design *represents the *Atrium* with four Columns; the length of which being divided into five equal parts, the breadth takes up three. The Wings (*that is, the space between the Wall and the Columns, which is not comprehended in the breadth of the Atrium*) have in breadth a fifth part of the height of the Columns. The Columns are *Corinthian*, and their diameter is equal to the breadth of one half of the Wings. The opening above is the third part of the breadth of the said *Atrium*, and the breadth of the *Charter-room* is half of the breadth of the same *Atrium*, and has the same length. From which *Atrium* one passes through the *Charter-room* into the *Peristylos*, which is a square and a half in length. The Columns of the first order are *Dorick*, and the breadth of the *Portico* is equal to the height of those Columns. Those of the second order are *Ionick*, and a fourth part less than the first, under which there is a *Pedestal* two Foot and three quarters high.

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| A. <i>Atrium.</i> | G. <i>Wings of the Atrium.</i> |
| B. <i>Door to the Charter-room.</i> | H. <i>Freeze under the Cornice of the Atrium.</i> |
| C. <i>Charter-room.</i> | I. <i>Opening on the top of the Atrium, with a Ballustrade round it.</i> |
| D. <i>Portico of the Peristylos.</i> | K. <i>Solid above the Columns.</i> |
| E. <i>Chambers near the Atrium.</i> | L. <i>Scale of ten Foot.</i> |
| F. <i>Portico through which one enters into the Atrium.</i> | |

C H A P. VI.

Of an Atrium made after the Corinthian manner.

THE Edifice which I am going to describe †, is at *Venice* in the Convent named the *Charity*, belonging to the regular Canons. I have endeavoured to make this House resemble those of the Ancients, and in order thereto, I have built a *Corinthian Atrium* in it, the length of which is the diagonal of its square. The wings (*that is, the spaces between the Wall and the Columns*) have in breadth two sevenths of the length of the *Atrium*, that is, one for each Wing. The Columns are *Composite*, and are three Foot and a half in diameter, and 35 Foot high. The aperture in the middle is one third of the breadth of the *Atrium*, taken between the Columns. Above the *Atrium* there is a Terrace level to the third order of the Cloister, where the Cells of the Canons are. The Vestry is on one side, near the *Atrium*, round about which there is a *Dorick*

Cornice

* Plate XXI. † Plate XXII.

Cornice which supports an arched ceiling. The Columns that are there, bear up that side of the Cloister's Wall, which in the upper part divides the Chambers or Cells from the Galleries. The Vestry stands in the place where the Ancients kept the Images of their Ancestors, and which they called the Record-room; tho', to suit with the conveniency of the place, I have made the wings of the *Atrium* serve for that use, opposite to the Vestry in the *Chapter-hall* answerable to one another. On the side near the Church, there is an *Elliptical*, or oval Stair-case, open in the middle, which is very commodious and agreeable. From the *Atrium* one enters into the Cloister, where there are three Orders of columns one over the other. The first is *Dorick*, and its columns project more than one half from the Pilasters. The second is *Ionick*, and the columns are a fifth part less in height than the former. The third is *Corinthian*, and diminishes also a fifth in the height of the second. In this last range, instead of Pilasters, there is a contiguous Wall; and over the center of the Arches of the two first orders, are Windows which give light to the Entries of the Cells, the arched ceilings whereof are made of cane, to discharge the Walls. Opposite to the *Atrium* and the Cloister, beyond the Stair-case, is the Refectory, or large Dining-room, which is two squares in length, and raised to the third Story of the Cloister. It has a Gallery on each side, and under it a Cellar made in the shape of a Cistern, that no Water may come into it. At one end are the Kitchen, the Ovens, the Poultry-yard, the Wood-house, the Landry, and a pretty fine Garden; at the other end are other Conveniencies. This Building has 44 Rooms, and 46 Cells, including the apartments for Strangers, and other places for several uses.

THE first* of the following draughts is a part of the *Atrium* drawn at large, and the second† is a part of the Cloister.

C H A P. VII.

Of the Testudinated Atrium, and the private Houses of the ancient Romans.

BESIDES the various forms of *Atriums* we have spoken of before, there was one very much in use among the Ancients, which they called *Testudinated* (that is, after the form of a *Tortoise*) and because what *Vitruvius* says of it is very obscure and difficult, and consequently requires a particular Observation; I shall therefore acquaint you with what I think upon that subject, adding also the disposition and situation of the *OEques*, or great Halls of the *Chanceries*, *Refectories*, Baths, and the like; so that the following Cut** shall represent all the parts of a private House, every one in its place, according to *Vitruvius*.

THE length of the *Atrium* is equal to the diagonal of its square, and has its full breadth in height, which reaches as far as the summer, or architrave of the Roof. The Rooms on the sides are six Foot less in height; and above the Walls which separate them from the *Atrium*, there are Pilasters which bear the Roof of the said *Atrium*: between these Pilasters there are some Apertures or Windows which give light to the said *Atrium*; for the Chambers have an open platform or terrace above them. The Record-room is opposite to the entry, and is two fifths of the breadth of the *Atrium*. This place served, as I said before, to put in the

Images

* Plate XXIII. † Plate XXIV. ** Plate XXV.

Images or Titles of their Ancestors. A little further one finds the *Peristylos*, about which are Piazzas as broad as is the height of the columns. The Chambers are of the same breadth, and their height, to the impost of the Arches, is equal to their breadth; as the Arches have in height the third part of their diameter. *Vitruvius* has described several sorts of *OEques*, which were great Halls or Salloons for Feasting and other Recreations, wherein also the Women did their work. Some of these were called *Tetrazyli*, because they had in them four Pillars. Others were called *Corinthian*, which were surrounded with semi-columns. The *Egyptian* ones had, over and above the first row of columns, a Wall, which inclosed them with half-columns placed directly above the lower ones, and a fourth part less. Between these pillars were the Windows that gave light to the Hall. The Height of the Galleries that surrounded it, did not exceed the columns of the first order; and above all there was a plat-form with a corridor, and an elbow-rail round the whole. I shall give a design of each of these kinds of Halls separately. The square Halls were to take the cool in during the Summer, and had commonly the prospect of Gardens or other Verdures. They had also another kind of Halls that were called *Cizicenes*, and which were also design'd for the abovesaid uses. The Chanceries and Libraries were generally on the East-side, as also the *Triclinia*, or Eating-rooms. There were likewise Bagnios for Men and Women, which I have represented in the further part of the House.

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| A. Atrium. | E. <i>A Hall with four Columns.</i> |
| B. <i>Record-room.</i> | F. <i>A Basilica.</i> |
| C. <i>Peristylos.</i> | G. <i>Apartments for the Summer.</i> |
| D. <i>Halls after the Corinthian manner.</i> | H. <i>Chambers.</i> |
| | I. <i>Libraries.</i> |

The following design * is for the same *Atrium*, from a larger Scale.

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|---|--|
| A. Atrium. | I. <i>Chambers about the Atrium.</i> |
| B. <i>Record-room.</i> | K. <i>Summers making the Freeze of the Entablature within.</i> |
| C. <i>Piazza about the inner court.</i> | L. <i>Windows which give light to the Atrium.</i> |
| D. <i>The inner court.</i> | M. <i>The flat above the Walls of the Atrium.</i> |
| E. <i>Door-way to the Record-room.</i> | |
| F. <i>Part of the Corinthian Hall.</i> | |
| G. <i>Galleries, or Piazzas.</i> | |
| H. <i>Piazza before the Atrium.</i> | |

C H A P. VIII.

Of the Halls with four Columns.

THE following design † is of that sort of Hall call'd *Tetrazylos*, because it had four columns. It was made square, and the columns served not only to proportion the breadth to the height, but also to make the upper place still the firmer; which is a thing that I have practis'd in most of my Buildings, as may be seen both in the designs I have already given, and in those that are to follow.

C H A P. IX.

Of the Corinthian Halls.

THE *Corinthian* Halls were of two sorts. The first had their columns only laid on the Floor, as may be seen in the first design*; and the second were laid on Pedestals, as in the second design†: But the columns in both were always near the Wall, and the *Architrave*, *Freeze*, and *Cornice* were made with Stuc, or else of Wood, and there was but one row of Pillars. The Ceilings were either made semi-circular, or scheme, that is, so flat as to have in height only one third of the breadth of the Room. They were generally advanced with compartments made with stuc and painting. The length of these Halls would be of a fine proportion, if it was of a square and two thirds of their breadth.

C H A P. X.

Of the Hall after the Egyptian manner.

THE following design** is for Halls after the *Egyptian* way, which very much resemble *Basilicas*, or Courts of Justice, (of which I shall also speak when I treat of publick Buildings) because these sorts of Halls had a Portico wherein the columns were at a distance from the Wall, after the same manner as in the *Basilicas*; and upon these Pillars were placed the *Architrave*, *Freeze*, and *Cornice*. The space between the Pillars and the Wall was covered with a platform surrounded by a Corridor with rails and ballusters. Above the same Pillars, there was a continu'd Wall with half Pillars on the inside of it, a fourth part less than the lower ones. Between the said half Pillars were placed the Windows that gave light to the Hall, and through which, when laid open, those that were on the platform could look into it. This sort of Halls must needs have been of an admirable magnificence, as well by reason of the ornaments of its Pillars, as for its height; because the *Soffite* reached above the *Cornice* of the second Order, and one may judge how commodious they were, for receiving great companies, for banqueting, and for all manner of Recreations.

* Plate XXVIII. † Plate XXIX. ** Plate XXX.

C H A P. XI.

Of the private Houses of the Greeks.

THE Greeks had a different way of Building from the Romans; for, as *Vitruvius* says, instead of making Portico's, or Galleries and Halls, they made the entry to their Houses very narrow *, placing on one side the Stables, and the Porter's lodges on the other. From this first entry, one pass'd into a Court, which had *Piazzas* on three sides, and towards that of the South they made *Anti*, or butments of Pilasters, which supported the joists of the Ceiling more inwards: because, that leaving some space between the one and the other, they had very large places, which they appointed for Lodgings to the Mistress of the House, and to the Men and Maid Servants. On the same Floor with these butments, there were some Rooms which we may call Anti-chambers, Chambers, and Drawing-rooms, being every one just behind the other. About the *Piazzas* were places appointed for eating, sleeping, and the like Family necessities. To this Building was another join'd, greater and better adorn'd, with larger Courts, wherein they made four Porticos, or *Piazzas* of equal height, if they did not make one of a larger size to the South; and then the Piazza on that side was called *Rhodian*, perhaps because the *Rhodians* first used this manner of Building. In these Courts were very magnificent Galleries to the Front: they had their own Gates, being inhabited only by Men. On the right and left side of this Building they made others, which, as well as the foregoing, had their own particular Gates, with all the conveniences necessary for a dwelling. There they used to lodge Strangers; for it was a custom among this Nation, that when they had a foreign Guest, they entertain'd him at their own Table the first day; but after that time they assign'd him an Apartment in this kind of House, wherein they furnished him with every thing necessary for his maintenance: so that Strangers were thus obliged to no Ceremony, and had the same liberty as if they had been all the while at their own home. And now I think I have sufficiently explained the ancient *Greek* way of Building, as well as that we practise our selves at present in the Towns.

Parts of a private House after the *Grecian* manner.

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|---|---|
| A. Passage at the entry of the house. | K. Great dining-room. |
| B. Stables. | L. Common Chambers. |
| C. Porter's Lodge. | M. Second Court, larger than the first. |
| D. First Court. | N. Piazza larger than the three others, the Court of which is call'd <i>Rhodian</i> . |
| E. Lobby, or Vestibule, thro' which people pass into the rooms. | O. Passage leading from the little Court to the greater. |
| F. Places where the women did their work. | P. Three Piazzas, the pillars of which are small. |
| G. First great Chamber, which we may call an Anti-chamber. | |
| H. A lesser room. | |
| I. A Closet. | |

Q. Cizicene

* Plate XXXI.

Chap. 12. *Of the Situation to be chosen for Country Houses.* 55

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|---|--|
| Q. <i>Cizicene Refectories, and Chan-</i> | V. <i>Apartments for Strangers.</i> |
| <i>ceries, or places that used to</i> | X. <i>Small passages which divided</i> |
| <i>be painted.</i> | <i>the strangers apartments from</i> |
| R. <i>Hall.</i> | <i>those of the master.</i> |
| S. <i>Library.</i> | Y. <i>Small open Courts.</i> |
| T. <i>Square Hall where they used to</i> | Z. <i>The principal street.</i> |
| <i>eat.</i> | |

C H A P. XII.

Of the Situation which ought to be chosen for Country Houses.

AS certainly 'tis highly creditable and convenient for a Gentleman to have a House in the City, where he is obliged sometimes to reside, either as occupying some publick Post in the Government, or for the management of his own private Affairs; so perhaps he may receive no less pleasure and advantage from a House in the Country, where he passes the rest of his time in seeing and improving his own Possessions, in augmenting his substance by industry and agriculture; where, by exercising himself, either in walking, or on Horse-back (which are only proper for the Country) he preserves his Body strong and healthy; and where, in a word, the mind being overlaboured by the fatigues of the City, will be singularly recruited and recreated: so that he may then quietly apply himself to the study of Books, or the contemplation of Nature, in imitation of those ancient Sages, who, on such accounts, used frequently to retire to the like places; where being visited by their virtuous Friends and Relations, and possessing Pleasure-houses, Gardens, Fountains, and such other Objects of diversion, but above all their own virtue, they could easily attain that highest pitch of a happy Life, that on this earth can be possibly enjoyed. Now, having already, by the help of God, finished all I had to say with relation to Houses in the City, 'tis but reasonable I should pass next to those in the Country, where private Affairs and Family-business are chiefly transacted. But before we come to give the design and draughts of such, it appears very proper to discourse a little about Situation, or the places fit to be chosen for such Buildings; and of the compartment or distribution of the parts of the same: because not being commonly (as in Towns) straiten'd for room by publick Buildings, nor confin'd by our Neighbours to certain determinate bounds, it is the duty of an able Architect to find out with all care and diligence the most commodious and healthy places; since People live in the Country for the greatest part of the Summer, during which season, our Bodies, even in the healthiest region, are apt to grow weak and sickly, by reason of the heats. In the first place therefore, let the seat pitch'd upon be, as near as possible, the most convenient for the owner's Estate, that is, towards the center of the same; to the end that without much fatigue, he may himself view the whole at any time, and make improvements all around; as likewise that the Tenants and Labourers may the more easily bring the growth of it to his House. If the Building can be erected near a River, it will much conduce to its Beauty and Convenience; because thus not only the products of the Land can at all times be the more easily carry'd by Water to the City, and that the Water itself will serve the uses of the House and Cattle; but it will render the prospect most

* It is a beautiful and commodious thing to build a Country-house upon a Moat, for the easy Transportation of Goods and Provision; besides, one may easily water Gardens and other Grounds.

agreeable, notably refresh the Air in Summer, and with no small advantage, as well as ornament, water the Fields, Gardens and Stalls, which are the very foul and support of a Country *Villa*. But if the situation can't be near a navigable River, let it be however near some Brook, or other running Water, and as far as may be from dead or stagnant Waters; because these generate the very worst of Air, which may be easily avoided, by building in elevated and agreeable places: I mean where the Air being free, is in a continual motion, and the Earth, by reason of its declivity, purg'd from all humid and noxious Vapours; where the Inhabitants are healthy, chearful, and very well complexion'd; and where one is not disturb'd with the noise of Gnats, and other troublesome little Animals, which breed in putrefy'd and marshy Waters. Yet since Water is absolutely necessary to the Life of Man, and that Waters of different qualities produce in us different Effects, (whence some beget the Spleen, some the Gout, others the Stone, and others other Distempers) so the utmost care is to be taken, that the House may be near such Water as has no odd or ill taste, and that has no particular Tincture: but, on the contrary, that it be limpid, clear, light, and such as, sprinkled, will not stain white Linnen, all these being signs of its goodness. *Vitruvius* has taught us many ways of trying the goodness of the water; and that Water is held perfect in its kind, which makes good Bread, wherein Greens are quickly boil'd, and which leaves no sediment in the bottom of the Vessel. It is an excellent mark of the goodness of Water, if in its passage there neither grow moss nor rushes; but that its bed be clean and fine, with sand or gravel at the bottom, and without mud or slime. The very animals that drink ordinarily of such Waters will give marks of their goodness, if they are hearty, brisk, strong, and in good case, being neither lean nor feeble. As for the salubrity of the Air, an indication of it, over and above those already mention'd, may be taken from old Edifices, if they are neither corrupted nor consumed; from the Trees, if they be thriving, beautiful, strait, and none of those that naturally grow in fenny places; from the Rocks and Stones of the place, if they shew no signs of rottenness in the part that's above the surface of the Earth; and even from the complexion of the Inhabitants, if it be natural, and shews a good Constitution. None ought to build in Valleys enclosed by Mountains: because Houses hid in such places, besides their being depriv'd of distant Prospects, and that they are not conspicuous to others, which loses all their Beauty and Reputation; they are moreover in every respect injurious to health, because the Earth, being impregnated with the Rains that settle there, sends forth Vapours pestiferous, not only to the Bodies, but also to the Minds of Men; the spirits being by their means debilitated, the joints emaculated, the Nerves relax'd, and the Provisions carried into Magazines and Graineries corrupted with moisture. If, on the other hand, the Sun can penetrate into those bottoms, the reflection of its Rays will cause excessive heats; or if it enters not, then a perpetual shade will render the People stupid, and spoil their Complexion. When the winds blow into them they are too impetuous, by reason of the narrow chops thro' which they must pass; and when they blow not there, the air stagnating of course, will become gross and sickly. The resolution being taken therefore to build upon an eminence, let a situation be chosen that faces the temperate region of the Air, and that is neither always overshadow'd by higher Hills, nor scorch'd up, as it were, with two Suns, by the reflection of the true one from some neighbouring Rock: for in either of these cases, it becomes an inconvenient habitation. Finally, in chusing a situation

for the building of a *Villa*, or Country-house, all those considerations are requisite, which are used in choosing the situation of a City-house: for as the City is but one great House, or Family; so every Family, or private House, is a little City.

C H A P. XIII.

Of the Compartments of Country-houses.

AFTER having found and pitched upon an airy, pleasant, advantagious and healthy Situation, one must think next on the Compartment of the Building, or the distribution of its parts, and to make it both elegant and convenient. Two sorts of Houses are necessary in the Country: one for the dwelling of the Master and of his Family; the other for the Farmer, who improves the Land and gathers the Rents, as well as for lodging the Cattle and the Fruits of the Earth. Therefore it will be requisite to dispose the situation of both the Buildings in such a manner, that the one may be no impediment to the other. The Master's House must be made suitable to his Quality, and proportion'd to the number of his Retinue, after the same manner as the City-houses, whereof we have treated before. There must be proper covers made for every thing belonging to the *Villa*, in proportion to the product of the ground and number of the Cattle, and contiguous to the main House, that the Master may easily go every where sheltered, without being hinder'd from minding his business by either Snow, or Rain, or the scorching heat of the Sun. This will serve also to shelter the Wood, and other numberless Country Provisions, which too much moisture of the Air, or the heat will spoil; besides, that such *Piazzas* will make the Building look much greater. Regard must also be had to lodge the Labourers, with all the Country tools and luggage conveniently, and allow them room enough. The Chambers of the Steward, of the Farmer, and of the Labourers, must be in a place convenient for them, and near the Gates for the Security of the other places. The Stalls and Stables for labouring Cattle, such as Oxen and Horses, must be far from the principal House, because of the ill smell of their dung; but they ought to be in a warm and airy situation. All breeding Creatures, such as Hogs, Sheep, Pigeons, Fowls, and the like, require each a place proper to their kind; and in this matter one must be ruled by the different customs of Countries. The Cellars must be under ground, very close, and in a dry place, far from all noise, moisture, or any ill smell. They ought to receive their light from the East to the North: because that the Sun shining from the other sides, would be apt to heat, debilitate, and spoil the Wine or other Liquors. One must give them a little declivity in the middle, upon a cement Pavement, or else with square Stones so well join'd together, that should the Wine happen to spill, one may take it up again. The tubs wherein the Wine is working, must be under covert near the Cellars; and be raised so, that the props may be a little higher than the bung-hole of the Pipes, to the end the Wine may be easily carry'd thro' Channels made of Leather or of Wood into the said Pipes.

The Architecture of A. PALLADIO.

THE Granaries must have their light from the North, because that on this side they won't be expos'd to the heats, but rather refresh'd by the Wind; and the Corn will be much better preserv'd, without being infest'd by the Mice, and such other Vermin as do it a great deal of hurt. One must floor the Granaries with excellent Earth; but when such is not to be had, Deals must be us'd, because Lime is a great Enemy to Corn.

THE other Store-houses, on the very same account, must have their lights to the same side. The Hay-lofts may be to the South or West; because when the Hay is thus well dry'd by the Sun, there will be no danger it should corrupt and take fire. The tools and implements belonging to Tillage, are best under coverts turn'd to the South. The Barns where the Corn is thresh'd must be expos'd to the Sun, spacious, large, upon a firm ground, and a little rais'd in the middle; as round about it, or at least on one of its sides, there ought to be a *Piazza*, that in case of a sudden Rain, one may immediately secure the Corn. 'Tis not proper it should be too near the Master's House, because of its dust; but it ought not to be so far from it, but that it may be within his view.

THIS in general is sufficient concerning the choice that is to be made of the Situation and Compartment of Country-houses: now, to acquit my self of my promise, I shall give here the draughts of some Houses, which, according to several Inventions, I have built in the Country.

C H A P. XIV.

The Draughts of several Country-houses built by Noble Venetians.

THE following House* is at *Bagnolo*, within two miles of *Lonigo*, a Castle in the *Vicentin*, belonging to the three Brothers, the magnificent Counts *Vistor*, *Marco*, and *Daniel Pisani*. On both sides of the Court are the Stables, Cellars, Granaries, and such other places for the service of the *Villa*. The Columns of the Porticos are of the *Dorick* Order. The Lord's Apartment is in the middle of the Building. The Floor of the first Chamber is rais'd seven foot above the level of the Ground, under which is the Kitchen, and other places belonging to the Servants. The Hall is arch'd, its height being equal to its breadth, and one half more. The Arches of the Galleries have likewise the same proportion. The Chambers are ceil'd, and as high as broad; the greatest are a square and two thirds long; the others are but a square and a half. There was not so great regard had in placing the two back-stairs, where they might receive a clearer light (as we have order'd in the first Book) because these Stairs serving only for the Offices underneath, or for the Granaries and other like places above, the chief care was to compleat the middle Apartment where the Master lodges, as well as Strangers; and the Stairs leading to this Story are very advantageously placed, as may be seen in the draught. Let this serve for a general advertisement to the prudent Reader, with respect to all the other Houses which have but one Story; because in such as have two fine ones, and well adorn'd, I have taken care to order it so, that the Stair-cases are very lightfome, and in convenient places: I say two Stories, because neither what is under ground for Cellars and such

* Plate XXXII.

such uses, nor what is above for Granaries and Garrets, is reckon'd among the principal Stories, as not serving to lodge Gentlemen.

THE House following * belongs to the magnificent Lord *Francisco Badoero* in the *Polesine*, in a place call'd *la Frata*. 'Tis situat'd upon an ascent, at the foot of which passes a branch of the *Adige*, where a Castle of *Salinguera de Este*, Brother-in-law to *Ezzelino Romano*, anciently stood. All this Building has a Pedestal five foot high for its Basis, at the level of which is the floor of the Chambers, which are all of them ceild and painted in *grotesque* of a very fine Invention, by *Giallo Fiorentino*. The Granaries are above; and the Kitchen, with the Cellars and other conveniencies, are below. The Columns of the Galleries in the body of the House are *Ionick*. The Cornice goes about the whole House like a Crown. The Pediment over the Portico makes a very fine shew, raising the middle of the House higher than the wings. Afterwards, as one goes downwards, there are the Farmer's and Steward's Habitations, the Stables, and such other places fit for a Country-house.

THE magnificent Lord *Marco Zeno* has put the following invention † in practice at *Casalto*, which is a place near the Castle of *la Motta*, in the *Trevigian*. It stands upon a basement, that furrounds the whole Building, equal with the floor of the Rooms, which are all arch'd. The height of the largest is according to our second manner. The Arches of the square Rooms are grinded in the angles about the Windows: Those of the Closets, or Rooms near the Galleries, are *fasciated*, as are those of the Hall. The Hall and Galleries are arch'd of an equal height, and are likewise both of them higher than the Rooms. This House has Gardens, a Court-yard, a Dove-house, and every thing that is necessary for a Country dwelling.

NEAR to *Gambarare*, on the *Brenta*, is the following Building **, which is the House of the magnificent Lords *Nicolo* and *Luigi de Foscarini*. The House is raised eleven foot from the level of the ground, and below are the Kitchens, Pantries, and the like places. Every thing is arch'd as well above as below. The Arches of the great Chambers are made after our first manner. Those of the Squares are arch'd round like a Cupola. On the Closets are *Mexanini*. The Hall is arch'd half round grinded: its impost is as high from the Floor as the breadth of the Hall, which is excellently painted by Messer *Battista Venetiano*. Messer *Battista Franco*, one of the best draughtsmen of our time, did also begin to paint one of the great Chambers, but he died before he could finish his Work. The Portico is of the *Ionick* Order. The Cornice goes round the whole House, and makes a pediment above the Portico, as well as on the opposite part. Under the Eaves of the Roof there is a second Cornice, which passes above the pediments. The upper Rooms are like *Mexaninos*, because of the little height they have, which is but eight Foot.

AT *Masera*, near the Castle of *Asolo*, in the *Trevigian*, is the following †† House, which belongs to the most Reverend *Daniel Barbaro*, Patriarch elect of *Aquileia*, and to the Lord *Marco Antonio Barbaro*, his Brother. That side of the Building which advances a little outwards, has two stories of Rooms. The floor of the higher ones is level with a Court that is behind, where there is a Fountain wrought in the Mount directly over-against the front of the House, with an infinite number of Ornaments, both of Stuc and Painting. This Fountain forms a little Lake, which serves for a Pond; from whence the Water over-

flowing,

* Plate XXXIII. † Plate XXXIV. ** Plate XXXV. †† Plate XXXVI.

flowing, goes into the Kitchen, and runs afterwards thro' the Gardens, which are on the right and left of the high Road which leads gradually to the House: there it makes two little Ponds, which serve also for watering-places on the highway, and running still further, it waters the Orchard, which is very large, and fill'd with excellent Fruit-trees, and all sort of pulse.

THE front of the Master's Apartment has four Columns of the *Ionick* Order. The capitels of these on the angles, face, or show alike on both sides. I shall teach the manner of making these capitels in the book of Temples. There are Galleries on both sides of the House, at the end of which are two Pigeon-houses; and below them are the pressies for the Vintage (*at the place mark'd A in the plan*) with the Stable, and other necessary places for Husbandry.

THE following House * is near the gate of *Montagnana*, a Castle in the Territory of *Padua*, and was built by the Lord *Francisco Pisano*, after whose passage into a better Life there remain'd part of it unfinish'd. The great Chambers are a square and three quarters long; the Arches are schem'd, and according to our second manner. The second size Rooms are square, and their Arches round or oven-wise. The Closets, and the Passage between, are of the same breadth: their Arches are two squares high. The Entry has four Columns, a fifth less than those which are without; and they support the floor of the Hall: besides that the height of the Arch is much finer and surer with them. The four Niches, which you perceive there, have each a Statue, representing the four Seasons of the Year, done by *Alessandro Vittoria*, an excellent Sculptor. The first Order of Columns is *Dorick*, and the second *Ionick*. The upper Rooms are ceil'd. The height of the Hall reaches as far as the roof. On the Flanks of this House, there are two wings, join'd to the House by two passages, which lead into the Kitchen and to some other Offices; in the middle of each of them there are two arch'd Gates which open into two Streets.

THE following draught † is the House of the magnificent Lord *George Cornaro* in *Piombino*, a place of *Castle-franco*. The first Order of the Portico is *Ionick*. The stair-case is as far as well can be into the House, that it may be less expos'd to heat or cold. The wings of the Hall, wherein you see the Niches, have the third part of their own length in breadth; and the Pillars range with the last but one of the Porticos exactly, and are as distant from one another as they are high. The great Rooms are a square and three quarters long; the height of the Arches is according to our first method of the height of Arches. The second-size Rooms are square, and a third higher than broad. The Arches are cross-grinded. Over the Closets are *Mezaninos*, or half Stories. The upper Portico is of the *Corinthian* Order: its Pillars are a fifth part less than the lower ones. The Chambers are ceil'd, and above them are some *Mezaninos*. The Kitchen, and places belonging to it, are on one side; and on the other are places for the Servants.

THE Building of the following draught ** belongs to the most illustrious Knight *Leonardo Mocenigo*, in a place call'd *Morocco*, on the road from *Venice* to *Trevigi*. The Cellars are level with the ground, and above them are the Granaries on the one side, as the Servants Lodgings are on the other. Over these are the Master's Rooms, forming four Apartments. The Arches of the greatest are one and twenty foot high, and are made of Canes, that they may be the less heavy. Those of the lesser ones are as high as those of the largest; but those of the Closets are only seventeen foot high, and are cross'd. The Gallery of the first story is

Ionick.

Ionick. In the lower Hall there are four Columns, which make the height and breadth to be proportionable. The second Order of the Portico is *Corinthian*, and its *Poggio*, or Pedestal, is two foot and three quarters high. The stair-cases are in the middle, separating the Hall from the Vestibule: both Stairs are opposite the one to the other, to the end that People may go up and come down both ways, which makes them very fine and convenient, besides that they are light enough. On the wings of this Building are the Wine-presses (*mark'd on the Plan A*) with the Stables, Galleries and such like places fit for a Country Family.

At *Fanzolo*, in the *Trevigian*, within three Miles of *Castel-franco*, may be seen the House of the magnificent Lord *Leonardo Emo*, built according to the following Draught *. The Cellars, Granaries, Stables, and other places for a *Villa*, are on each side of the Master's House; at each end of which there is a Pigeon-house, which, besides the ornament to the place, brings likewise profit to the Owner. People may go under shelter every where about this House, which is one of the most considerable conveniencies that ought to be desir'd in a Country-house, as we have already observ'd. On the back of this Building there is a square Garden, which contains fourscore *Trevigian Acres*; in the midst of which runs a little River, which renders the situation very fine and agreeable. This House is adorned with several pieces of Painting done by *Battista Venetiano*.

CHAP. XV.

The Draughts of some Noblemen's Seats on the Terra Firma.

IN a place of the *Vicentine*, call'd *Final*, is the following House †, which belongs to the Lord *Biagio Sarraceno*. The floor of the Rooms is rais'd five foot from the ground. The great Chambers are a square and five eighths long, their height being equal to their breadth, and are all ceil'd. This height is also continu'd in the Hall. The Closets near the Galleries are arch'd: the height of the Arches is equal to that of the Rooms. The Cellars are below, and the Granaries above, being of the same extent with the whole House. The Kitchens are without, but so near that they are convenient enough: all the other places, necessary to a Country-house, are on the two sides of the Building.

THE draughts that follow ** are of the House of Signior *Girolamo Ragona*, a *Vicentine* Gentleman, who built it at one of his Lordships call'd *le Ghizzole*. This House has the same conveniency I have mentioned above, which is, that one can walk every where under covert. The floor of the Master's Apartments is rais'd twelve foot above the ground. Under these are all the conveniencies for the Household. Above are other Chambers, which may not only serve for Granaries, but also for Lodgings upon occasion. The principal stairs are in the fore-front, and answer directly to the Porticos of the Court.

At *Pogliana*, a place in the *Vicentine*, is the following House *†, belonging to the Cavalier *Pogliana*. The Rooms have been adorn'd with Paintings and very fine stuccatures by *Messer Bernardino India*, and *Messer Anselmo Canera*, Painters of *Verona*, and by *Messer Bartholomeo Rodolfi*, Sculptor of the same place. The great Rooms are a square and two thirds long, and arch'd. Over the Clo-

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sets

* Plate XL. † Plate XLI. ** Plate XLII. *† Plate XLIII.

fets are *Mezaninos*. The height of the Hall is one half more than its breadth, and is equal to the height of the Gallery. The Hall is arch'd with a *Fascia*, and the Portico with a cross-grinded Arch. The Granaries are above all these Apartments, as the Cellars and Kitchen are under them; because the floor of the first Story is raised five foot above the ground. The lower yard, and other places for the use of a Country-house, are on one side of it, and a Garden which answers to the yard is on the other side. Behind the House is an Orchard and a Fish-pond: so that this Gentleman, who is magnificent, and of a noble spirit, has spar'd nothing which he thought might bring ornament or conveniency to this House, in order to make it as fine, delightful, and compleat as possible.

AT *Lixiera*, a place near *Vicenza*, Signior *Gio. Francesco Valmarana*, of blessed Memory, built the following House *. The Galleries or Porticos are *Ionick*; the Columns are upon a square base which surrounds the whole House. To the level of this basement is the floor of the Gallery and Rooms, which are all ceil'd. At the Angles of this Building there are four arch'd Towers; the Hall is also arch'd with a *Fascia*. This House has two Court-yards, the one forwards for the use of the Master, and the other backwards, where they thresh the Corn. About this Court are coverts, and all other places necessary to a Country-house.

THE Counts *Francesco*, and *Ludovico de Trissini*, Brothers, began the Building of the following † Draught at *Meledo*, a place in the *Vicentine*. Its situation is very fine, being on a Hill, that's wash'd by a little River, in the midst of a spacious Plain, and on a well-frequented Road. On the top of the Hill there is to be a Hall encompass'd with Rooms; but rais'd so high that it may receive its Light above them. This Hall has some demi-pillars, which support a Corridor, to which People enter by the upper Chambers, which serve but for the *Mezaninos*, being only seven foot high. Under the floor of the first Chambers are the Kitchens, Pantries, and such like places. And because every front of the House has a very fine prospect, there are made four Porticos or Galleries to them of the *Corinthian* Order; above the pediments of which one sees the Cupolo of the Hall. The Galleries that come round it look extraordinary well. The Hay-lofts, Cellars, Stables, Granaries, the Farmer's Lodging, and other Family conveniencies are lower. The Columns of the Porticos are of the *Tuscan* Order; and at the corners of the Court near the River are two Dove-houses.

THIS Building ** is at *Campiglia*, a place of the *Vicentine*, and belongs to Signor *Marfo Repeta*, who finish'd it according to the design of the late Signor *Francesco* his Father of blessed Memory. The Pillars of the Porticos are of the *Dorick* Order; the intercolumnation is four diameters of a column. In the two remotest Corners of the Roof, where one sees the Galleries, without the main body of the House, there are two Dove-houses and Galleries. On the side towards the Stables are divers Chambers, every one dedicated to some particular Virtue, as one to Justice, another to Chastity, and others to other Virtues, with Elogiums and Pictures appropriated to the subject. Part of these were done by *Battista Maganza*, a *Vicentine* Painter, who is also an excellent Poet, and who has done all this designedly, that as the Gentleman receives those who visit him most courteously, so he may lodge every one of his Guests and Friends in the Apartment of that Virtue to which he thinks them most inclined. In this Building one may go every where conveniently under Piazzas. And since the Farm-house is of the same Order with that of the Master's it self, all that this last wants

in

* Plate XLIV. † Plate XLV. ** Plate XLVI.

in greatness by not being more costly than the other, is sufficiently made up to the former, by being equal both in ornament and symmetry.

THE following House* belongs to the two Brothers, the Counts *Edward* and *Theodore de Thieni*. It stands in a place call'd *Cigogna*, where Count *Francis* their Father began to build it. The Hall is in the middle of the House, and round it are some *Ionick* Pillars, which support a Corridor which is level with the floor of the upper Rooms. The Arch of this Hall reaches to the Roof. The great Rooms are arch'd with a *Fascia*, the square ones Oven-wise, and are raised in such a manner, that they form four little Turrets on the angles of the Building. The Closets have *Mezaninos* above them, whose doors are over-against the middle of the Stairs, which have no Wall in their middle: and as the Hall, by receiving its light from above, is extraordinary lightfome, these *Mezaninos* are also sufficiently light; and by so much the more, as they have their light from the top, being open in the middle. The Cellars and Granaries are in one of the cover'd fides, or Arches of the yard; and in the other are the Stables, with the other places serving for Country uses. The two Galleries that make as it were the two arms of the main Building, serve to unite the Farmer's House to that of the Master. There are two yards with Porticos, the one serves to lay up the crop, the other to lodge the Husbandmen and their Servants.

THE following House† belongs to Count *Giacomo Angarano*, who built it in his Lordship of *Angarano*, a place in the *Vicentine*. On both sides of the Court are the Cellars, the Granaries, the Wine-presses, the Farmer's House, the Stables, with the Dove-house; and beyond there is on one side a Court or Yard for the Country necessities, and on the other side a Garden. The Master's House is in the middle, all the first story of it being arch'd, and the second ceil'd. The Closets, both above and below, have *Mezaninos*. The *Brenta*, a River very plentiful of excellent Fish, runs near this Building. The place is famous for its delicious Wines and Fruits, but more especially for the courtesy of its Lord.

THE following draughts** are of Count *Ottavo Thieni's* House, in a place call'd *Quinto*. This Building was begun by Count *Marc Antonio* his Father, of happy Memory, and by Count *Adriano* his Uncle. The situation is very fine, for it has the *Tessina* on one side, and a pretty large branch of the same River on the other. This Palace has a Gallery before its Gate of the *Dorick* Order, thro' which one passes into another Gallery; and from that into the Court, which has also two Galleries in its wings, at the end of which are all the Rooms and Apartments, of which some have been painted by *Giovanni Indemio*, a *Vicentine*, and a very ingenious Man. Over against the Portico of the entry there is another Gallery exactly like it, which brings you to an *Atrium* with four Pillars, and strait forwards to a Court whose Porticos are of the *Dorick* Order. It serves for all the uses of the *Villa*. There is no principal stair-case, that has any proportion to the rest of the Building; because the upper part of this House serves only for Wardrobes, Stores, and Lodgings for the Servants.

AT *Lonedo*, a place in the *Vicentine*, is the following House††, belonging to Signor *Girolamo de Godi*. It is situated on a little Hill that has a very fine prospect, near a River that furnishes it with Fish. To render this situation proper for Country purposes, they have made yards and passages supported by Arches at a very considerable Expence. The Master's and Family's Apartment is in the middle of the Building. The floor of the Chambers is raised thirteen foot from the level of the ground, and they are ceil'd. The Granaries are above; and below

under

* Plate XLVII. † Plate XLVIII. ** Plate XLIX. †† Plate L.

under the raising of the thirteen foot, are the Cellars, Kitchens, places to make Wine, and other necessary conveniencies. The height of the Hall is to the very roof, and it has two rows of Windows. At each side of the House there are great yards with coverts, serving for Country uses. The House is painted with great nicety by Messer *Gualterio Padovano*, Messer *Battista del Moro* of *Verona*, and Messer *Battista Venetiano*: for this Gentleman having a mind to make his House as perfect as possible, and having himself no small judgment, spar'd no cost to get the most excellent Workmen and Artists of our time.

At *Santa Sophia*, a place within five Miles of *Verona*, is the following House*, which belongs to Count *Marc Antonio Sarego*. Its situation is on a very fine Hill of a most easy ascent, between two Valleys, from whence one sees a great part of the City. Round about are several other Hills very agreeable to the Eye, and abounding with excellent Waters, whereby the House and Garden are adorn'd with several admirable Fountains. By reason of its agreeableness, this place was formerly the delight of the Lords *de la Scala*; and we may also judge, by some old Ruins which are found there, that in the time of the ancient *Romans* it was in great esteem. That part of this Building which serves for the Master's Apartment and his Family, has a Court wholly surrounded with Porticos. The Pillars are of the *Ionick* Order, and coarsly wrought, as seems to become a Country-house, to which nice and finish'd Works bear not so true a resemblance as plain and natural ones. These Pillars support the Cornice, which makes the Gutters that receive the Rain that falls from the top of the House; and behind are some pilasters under the Porticos, that bear the floors of the second story. In this same second story are two Halls over-against one another, the largeness of which may be seen in the draught† by the lines that go cross each other, and are carry'd on from the further Walls to the Pillars. Near this Court is the Farmer's Yard, where there are on both sides all the coverts necessary for Country matters.

THE following** is the House of Count *Annibal Sarego*, in a place of the *Collognese* called *la Miga*. The whole Building is raised on a Pedestal or Basement four foot and a half high; level to which is the floor of the first Chambers; under which are the Cellars, Kitchens, and other Places for the Lodgings or other uses of the Family. The first Chambers are arch'd, and the second ceil'd. The Farmer's yard, with all the Country conveniencies, is near the House.

* Plate LI. † Plate LI. ** Plate LII.

C H A P. XVI.

Of the Country-houses of the Ancients.

HITHERTO I have given the draughts of several Country-houses done by my direction: it remains that I now give you some* after the manner of the Ancients, according to what *Vitruvius* has deliver'd; for in these you may see all the places belonging to the Lodgings, and the conveniencies of the Country, turn'd to the regions of the Heaven that are most proper. I shall not here insist upon what *Pliny* says about this Subject, my design being only at present to explain what *Vitruvius* says^a of it. The principal front of the Building is turn'd to the South, and has a Gallery, from which one enters by a passage into the Kitchen, which receives its light above the places adjacent, as it must have the Chimney in the middle. On the left-hand side are the stalls for the Oxen, the manger whereof must be turn'd to the East. The Bagnios must also be on the same side, and at the same distance from the Kitchen as from the Gallery, because of the room they require. On the right-hand you have the Oil-presses, and other places for the Oil, which answer the places of the Bagnios, and are turn'd to the East, South and West. The Cellars are backwards, far from all noise, and open to the North for fear of the Sun. The Granaries are above and receive the same light, and the same way as the Cellars do. On the right and left sides of the Court are stalls for the Cattle, stables for the Horses, conveniencies for Sheep and other Animals; with Hay-lofts and Barns to put the Straw in, as well as Bake-houses, all which must be as far from any Fire as may be. The Master's Habitation is backwards, the principal front of which is opposite to the Farmer's House; so that in these Country Buildings the Halls are always in the back part. All the same things were observ'd in these, whereof we have spoken above, in giving the draughts of the private Houses of the ancients, which is the reason why I have had no regard now but to what purely concerns the Country. In all the Buildings which I have made in the Country, and also in some of those in Towns, I have always placed the Pediments before, where the principal Gates are; because they make the principal entry to the House more observable, and contribute very much to the magnificence and nobleness of the Building. This gives the fore-part a great advantage over the others, and therefore it must be made higher; besides that it is much properer to put there the Arms of the Owner, which are commonly placed in the middle of them. The ancients employed them also in their works, as is to be seen in the old remains of Temples and other publick Buildings; from which 'tis probable, as I have observed in the Preface to my first Book, that they borrow'd the contrivance and proportions of private Houses. *Vitruvius* in the last Chapter of his third Book, teaches us how to make them.

^a *Scamozzi* intirely dislikes this Design of *Palladio*, and he has made one in his Book as far in my opinion from *Vitruvius* as this; and *Vitruvius* says, that in private Buildings it is proper to talk with Moderation of any part of publick Buildings. Besides, he gives here only a general Description of placing the Parts for Use and Decorum. *Scamozzi* puts the Kitchen in the back part of the House, and not in the Courts; which is against the Text of *Vitruvius*, alluding more to an Epistle of *Pliny*.

* Plate LIII.

C H A P. XVII.

Of some Inventions suited to different situations.

MY first intention was not to write but of those Buildings only that were brought to their perfection, or at least so far advanc'd, that one could soon hope to see them finish'd: but having observ'd, that it is often necessary to confine one's self to the situation, and that one has not always free room to build, I have thought it would not be amiss to add to my former draughts some new inventions of my own (which were desir'd of me by several Persons of Quality, tho' some alterations in their affairs have obstructed the execution) because the irregularity and difficulty of their situation, and the method I have observ'd to contrive the Chambers and other places, so as to be correspondent and proportionable to each other, may, in my opinion, prove of no little use and advantage.

THE situation of this first draught * is of a pyramidal form: the basis of the Pyramid makes the principal front of the House, which has three Orders of Pillars, *Dorick, Ionick, and Corinthian*. The *Vestibule* is square, and its Arch, the height and breadth whereof is equal, is supported by four columns. On the one and the other side are two Chambers, whose length is a square and two thirds, and they are arch'd after our first way. They have every one a Closet, with a small Stair-case to go up to the *Mezaninos*. At the end of the entry I had placed two Chambers a square and a half long, with two Closets near them of the same proportion, which would also have had their stairs to the *Mezaninos*: and farther, I contriv'd a Hall of a square and two thirds long, with columns equal to those of the *Vestibule*. Next to this there had been a Gallery, on both sides of which I would have placed two out-stairs, and farther on a yard, in one side of which should be the Kitchen. In the second story the Chambers were to be twenty foot high, and those of the third eighteen: but the height of each of the Halls was to be quite to the Roof, and level with the Chambers of the second story; the Halls would have had some Balconies, or Corridors, wherein to place Persons of distinction at the time of Festivals, Banquetings, or such like diversions.

I MADE the following draught † for a situation in *Venice*. The principal front has three Orders of columns, the *Ionick*, the *Corinthian*, and the *Composite*. The *Vestibule* advances a little outwards, and is adorn'd with four columns, equal and like to those of the front. The Chambers, which are on the wings, are arch'd after our first method. Besides these, there are other Chambers that are smaller, and Closets with stairs to go up to the *Mezaninos*. At the end of the entry one goes thro' a passage into a second Hall, which on one side has a little Court, by which it receives its light, and on the other the principal Stair-case of an *Elliptical* form, and open in the middle, with columns all round, that support the steps. Farther on you have another passage whereby to enter into a Gallery, the columns of which are *Ionick*, and equal to those of the *Vestibule*. On each side of this Gallery there is an Apartment like those at the entry, but that on the left hand is in a place which contracts it a little more. Hard by there's a Court adorn'd quite round with columns, which form a Corridor, that serves for the Apartment

* Plate LIV. † Plate LV.

Apartment of the Women, wherein they cook, and which therefore should be backwards. The upper part is like the lower one, except the Hall; which is above the entry, has no columns, and is raised to the roof, having a Corridor that is level to the Chambers of the third story, and might also serve the upper Windows, because this Hall has two Rows of them. The floor of the lesser Hall will be of the same height with the Arches of the second Chambers, these being twenty three foot high. The Chambers of the third story are eighteen foot high, and ceil'd. All the Doors and Windows would be directly perpendicular over one another, and each Wall would bear its share of the weight, were the design executed. The Cellars, Laundries, and other Offices, would have been under ground.

SOME time ago I made the following draught *, at the request of the two Brothers Count *Francisco* and Count *Lodovico de Trissini*, for a place they had in the City of *Vicenza*; according to which the House would have had a square *Vestibule*, divided into three spaces by rows of *Corinthian* columns, to give more strength and proportion to its Arch. On the Wings would have been two Apartments, with seven Rooms in each, including three *Mezaninos*, for which the stairs, which are next the Closets, would have serv'd. The height of the great Rooms was to be twenty seven foot; that of the lesser, and least of all but eighteen. Farther in you would have found a Court, surrounded with Galleries of the *Ionick* Order. The columns of the first floor of the fore front were also to be *Ionick*, and equal to those of the Court; those also of the second floor were to be *Corinthian*. The Hall would have been wholly free, of the same bigness with the *Vestibule*, and raised up to the roof; and level to the floor of its *Soffita* there would have been a Corridor. The great Rooms would have been ceil'd, but the lesser and smallest ones arch'd. The Womens Apartment, with the Kitchen and the like Offices, were to be on one side of the Court; as the Cellars, a place for firing, and the rest of the Household conveniencies, were to be under ground.

THIS other invention † was for Count *Giacomo Angarano*, who had also a spot of ground in the same City. The columns of the front are of the *Composite* Order. The Chambers on the side of the Entry are a square two thirds long. Close to them there is a Closet, with a *Mezanino* above it. After this, you pass to a Court surrounded with *Porticos*, the columns whereof are thirty foot, with Pilasters behind them (which *Vitruvius* calls *Parastates*) to support the floor of the second Gallery, upon which there is yet another open one, level with the highest floor of the House, rail'd all round. Farther in, you find yet another Court, surrounded also with *Porticos*; the columns of the first Order of which are *Dorick*, and of the second *Ionick*. The stairs are in the Court, and opposite to them are Stables, where might also be placed the Kitchen and the Servants Lodgings. As to the upper part, the Hall should have been without columns, and its ceiling must have reach'd to the roof of the House. The Chambers would have been equally high and broad, having Closets and *Mezaninos* like the lower ones. One could make a Corridor upon the Columns of the fore-front of the House, which might be very convenient on several occasions.

IN *Verona*, on a very fine situation called *Gli Portoni della Brà*, Count *Gio Battista della Torre* had a mind to build according to the following draught **. The House was to be adorn'd with Gardens, and all manner of imbellishments that can make a place convenient and delightful. The first Rooms were to be arch'd,

* Plate LVI. † Plate LVII. ** Plate LVIII.

arch'd, and above all the little ones would have been *Mezaninos*, with small stairs to go up to them. The Chambers of the second story were to be ceil'd. The height of the Hall was to be as far as the roof, and level with the floor of the *Soffit* would have been a Corridor or Balcony. It was to receive its light from the Gallery; and from the Windows it was to have on the wings.

I HAD also given to Signior *Gio. Battista Garzadore*, a *Vicentine* Gentleman, the following draught*, in which there are two Galleries after the *Corinthian* Order, the one before and the other behind. These Galleries have their *Soffits*, and the lower Hall also, which is in the inner part of the House; that during the Summer they may be cool there, and it has further two rows of Windows. Its *Soffit* is supported by four columns, which likewise support the floor of another square Hall that is above it, but without columns. It is almost as high as it is broad, and indeed only higher, as the Cornice is in thickness. The Arches of the great Rooms are raised after our third method, and those of the Closets are sixteen foot. The upper Rooms are ceil'd. The columns of the second Galleries are *Composite*, and a fifth part less than the lower ones. Upon these Galleries are *Frontons*, which give, as I have already said, a great air and nobleness to a Building, making it appear higher in the middle than on the wings; besides that, they also serve to contain the Arms of the Family.

THE illustrious Signor *Leonardo Mocenigo* desir'd I should make the following draught† for a spot of ground he had on the *Brenta*. Four Galleries, of a quarter of a circle each, like the Arms of the House, seem to accost and embrace all those that come towards it. The Stables are on the sides of these Galleries, in the fore part, that looks to the River; and the Kitchen, with the Farmers and Husbandmens Apartments, are on the back part, taking up also the sides. The Gallery, which is in the middle of the fore-front, is after the *Pycnostyle* manner, that is to say, that the columns are very thick, and near one another; and because these columns are forty foot high, they have some pilasters behind them, that are two foot broad, and a foot and three inches thick, which support the floor of the upper Gallery. Further one finds a Court surrounded with Galleries after the *Ionick* Order. The *Porticos* are as broad as the Pillars are high, excepting only one diameter of a column. The Galleries and the Chambers that look towards the Gardens, are also of the same breadth, to the end that the Walls, which make the separation of every Apartment, may be directly in the middle, to bear the weight of the roof. The first Chambers would be very convenient Dining-rooms, if there should happen to be great Company in the House. They are of a double proportion. The Chambers on the angles are square, and are arch'd with a *Fascia*. The Impost is as high as the diameter of the Chamber, and the Arches are a third part of their breadth in height. The Hall is two squares and a half in length: columns are plac'd in, that they may make the length and breadth proportionable to the height; and these columns should have been only in the lower Hall, that the upper one might be altogether free and agreeable. The columns of the Galleries above the Court, are a fifth less than the lower ones, and are *Corinthian*. The upper Rooms are as high as they are broad. The stairs are at the end of the Court, and go up each a contrary way to the other.

WITH this draught I shall, God be praised, finish these two Books, wherein I have endeavour'd with all possible brevity, to put together, and to teach most

clearly,

clearly, as well by Words as by Draughts, all tho' sethings that I have thought the most necessary and important in the Art of Building well; and more particularly with respect to private Houses, which are to be beautiful and magnificent, convenient for the Owner, and creditable for the Builder.

R E M A R K.

I KNOW not the reason why this plate was not inserted by Palladio, in some part of his Book, among his other draughts of private Houses, since it appears manifestly, that it comes from the same hand with all the rest, and that 'tis probable it was not design'd for any other purpose; if it be not, perhaps, that the Graver did not finish it time enough for the Printer, as we have seen above, page 47, that the like has happen'd once before. But be this how it will, the draught deserves a place here. Yet that it may be distinguish'd as adopted, or rather a posthumous piece of this our Author, I have singulariz'd it by a different Character, and give it the last place, to avoid breaking in upon the order of the Book: besides that this plate, with two others of the same Author, (which are the plan and elevation of the Dorick Temple, that I reserve for the conclusion of this work) were found among the rest, that were sent from Venice to Mr. de Chambray at Paris, who first inserted them in his French Translation, from whence I took it.*

* Plate LXI.

The END of the Second Book.



NOTES and REMARKS of INIGO JONES upon the
Plates of the Second Book of *PALLADIO*'s Architecture :

Taken from the Manuscript of the said INIGO JONES, in the Library of
Worcester-College, Oxford, June 23, 1741.

PLATE II. A. The Ranging or Continuation of the Base between the Columns left off, and the Rustic continued to the bottom of the Base, I do approve of, being well judged.

B. The Rustic Coings of this Building agree well with the Rustic of the Front.

PLATE III. The higher part of this Building to the prick'd Line is finish'd, but the rest have some part of the Basement up only. If this Building had been finish'd, it would have been a very magnificent Palace.

B. The Columns are of Brick, the Soffita is of Wood-work.

PLATE IV. The *Ionick* Columns are $\frac{1}{2}$ part less, than the *Dorick* Columns under them.

A. The Rail and Bannister is set in one Width, the Wall and the Jambs of the Windows, with the Seal of the Mold, ranges all along the Pedestal; and the Bannisters stand directly on the top of the *Dorick* Cornice.

B. The Plinth has only the upper Members of the Base of the double Columns, and does agree with the rest of the Pedestal.

PLATE V. A. This House has two Fronts and two Entries in two different Streets.

B. Are the largest Rooms by the Entrance, and are arch'd; the other Rooms are likewise arch'd of the last manner of arching, and the upper Rooms are arch'd a Botte.

All the Rooms of the two principal Stories are adorn'd with Stucco and Painting.

C. The Hall at the Entrance is arch'd a Crochiera upon four Columns, for more Strength and for supporting the Arches.

E. Passages into the Court. H. The Court has a Portico round it, the Columns are 36 Feet 6 Inches high, which is the whole height of the principal Story.

F. Are the Stables.

G. The principal Stair-case is placed under the Portico, in the middle of the Court.

H. The Court is not finish'd, but only as far as to the prick'd Line; and the rest of the Front within is entirely finish'd.

PLATE VI. B. The Windows are adorn'd with Statues and Festoons, exactly as in the Plate; and the Wall of this Story is not Rustic, but richly adorn'd.

The Rustic of this under Story is very neatly done.

PLATE VII. The way of the Scamilli Impars from those Ballustrades is set in as much as the Projection of the Base even with the Pedestal.

This is the part of the Peristyles but not yet done.

The Square over the Modillions of the Rail is just in the middle of the Columns.

PLATE IX. This *Grecian* Hall doth answer well; for I saw one of these Halls finish'd.

A. All this Part is old Wall.

From B to C, this part is all finish'd.

D. Old Portico.

The fore-part of this House is not begun; the old Building stands.

E. The Coings are all of rough Bricks.

F. The other Pilasters are of Stone.

I have observed that the Stucco or Finishing which covers the Brick Columns is made with Marble Dust, and the Stucco that they used within Doors is made of Mortar only.

PLATE X. A. The Architrave, Freeze and Cornice is of Stone.

B. These two Capitals were carved by *Palladio*'s own Hands, as the Masters at *Vicenza* told me.

C. The Leaves or linging of the Capitals are not carved.

D. The Ornament in the Freeze is omitted.

E. These Pilasters are very flat.

F. The *Ionick* Columns to the Windows are $\frac{1}{2}$ round.

G. The Rustic Bozzi or Square projects out from the Columns two Inches, which makes it to be perpendicular with the Projection of its Base.

H. A flat Rustic, or rather cut Rustic, to be imitated.

I. Between the Wave of the Cornice of the Pediment of the Windows and Pilaster;

E. is $\frac{1}{2}$ of the same Pilaster, which makes the return of the Angle Pilaster.

K. The Windows of the Basement Story are of rough Rustic Work.

Scamozzi and *Palermo* said, that these Designs were of *Julio Romano*, but adjust'd by *Palladio*; and so it seems.

PLATE XII. These Stairs A. have Columns that support the sloped Arch a Crochiera; and between the Columns you may look down, and on each Column are Torches set up to light the Stairs.

As far as the prick'd Line the Building is new, and the rest is old.

The Passages are arch'd a Mezza botte.

To this Stroke it is of Stone, and all the rest of Bricks.

PLATE XIV. A. The great Rooms which are paved of Shoeca of several Designs or Compartments.

B. The small Rooms are arch'd a Mezza botte, and painted in Grottesco.

There is four Wood Stair-cases in the four Corners of the Hall; two of which are

are triangular, and the other two are round.

Throughout this House I did perceive no manner of Cracks nor Settlements; but it stands very solid and firm.

A great Sum of Money must have been spent in building of this House, and especially for the Terraces.

PLATE XV. This Lanthorn D. at the top of the Cupola is not set on; but a Net to cover the top Hole to keep out the Flies.

E. The Tying does not look well, considering the Richness of the Statues, and Beauty of the Building.

C. The Columns are of Bricks, except their Bases and Capitals, which are of Stone.

PLATE XVIII. A. This Freeze is enrich'd with Heads and Festoons.

B. This Freeze is enrich'd with Boys and Foliage.

C. The Compartments of Flowers over the Windows are made of Stucco; so much Stucco on the out-side does not well.

PLATE XX. A. The Breadth of this Atrium is $\frac{1}{2}$ of its Length.

C. The Tablino is $\frac{1}{2}$ Parts of the Breadth of the Atrium, and Square besides the two Half circles.

E. The Portico is as wide as the Height of the Columns.

G. The Courts are $\frac{1}{2}$ longer than they are large.

PLATE XXI. D. The uncovered Gallery or outside Passage, which leads to the Stairs and brings you up into the Rooms at right and left.

PLATE XXII. A. Loggia. B. Refectorio. C. Calizola Scoperta. D. Vault Sotto Sesta a Fascia. E. Most of these Walls are 2 Bricks and $\frac{1}{2}$ thick.

F. So far as this is finished; the rest is not finished, by reason of the great Expences one of the Fathers told me, that each Arch of the Peristyle would cost a thousand Venetian Ducats, meaning throughout finished with Inrichments. The Atrio is finished, the Columns are of Bricks, with red Stucco; the Base and Capitals are of Stone, the Roof of the Gallery above the Enablature is of Timber, and was paved with Bricks; but by reason of the Rains passing thro' they have been obliged to make another Roof to the top of the Building, and supported by Pilasters, and covered with Tiles; so that about the Opening of the Atrio above is a covered Terrace to walk on.

All this Building is of Brick, and the Ornaments of Stone; on the side of the Peristyle is done clean, and the Coings; the oval Stairs are excellent, and the Rail of the Stairs is up to the top.

The open oval Stairs with a Rail and Banister of Stone upon the Steps is extremely well executed.

PLATE XXIV. A. B. Shews the Dripping of the Pavement of the Terrace.

B. Shews likewise, that this Plinth is raised over the hinder part of the Cartooch, as you will find or see in the Profile of the Cornice.

C. The Sfondari to the Ovolo are all in one without the Corona, and the Cartooches are turned into a Corona, with a Cimafla and a Wave.

The Bases and Capitals of the Columns are of Stone and the Columns of Bricks, and the Freeze of Wood.

PLATE XXVI. L. The Windows that give Light to the Atrio has a Rail to prevent the People's falling in that are walking upon the Terrace M.

PLATE XXVII. A. In this Design the Cornice of the Sfondati in the middle and sides of the Hall are all of one height, which it should not be.

B. The middle Space from Column to Column is as wide as it is high.

C. Is the Plan of the Hall, of a perfect Square.

PLATE XXVIII. A. This square Fascia does well between the Columns; its Projection takes but little room.

B. The Base has only the Fillet and upper Boultel of the Columns.

PLATE XXIX. A. This *Corinthian* Hall is in height from the Ground to the prick'd Line as much as it is broad, and the Arch is in height $\frac{1}{2}$ of the breadth of the said Hall.

PLATE XXX. The upper Columns are half round, and they are $\frac{1}{2}$ shorter than the under ones, and have Windows between the Columns.

A. An uncovered Terrace to walk round the Hall, and for the Windows to receive Light from it.

B. The Basement round the Hall at the top of the Cornice stands upon Half-columns, perpendicular with the Columns underneath.

The Joining of the Stone in the Architrave, Freeze and Cornice, is as well as in the Soffita.

PLATE XXXI. R. The *Grecian* Hall and Library S, are one Square and an half long, besides the two half Circles; and longer I do not fancy them.

The two $\frac{1}{2}$ Circles are $\frac{1}{2}$ part of the length of the Hall R, and Library S.

The Recesses in this Hall are made at pleasure.

PLATE XXXII. A. The Hall is arched a Crochiera or Groin, and is one and an half as high as it is wide; and also this is the Lodge.

B. The Stair-case that serves the upper and under Rooms, are not so well as they might have been; but the principal Stairs C, are exceedingly well placed.

D. The Columns of the Portico are of the *Dorick* Order; the middle part of the Building F, is for the Lord of the House.

E. On both sides of the Court are the Stables, Cellars, and Granaries.

G. The Basement is 7 Feet high from the Ground, and in it is the Kitchen and other Offices.

The Rooms are a perfect Cube.

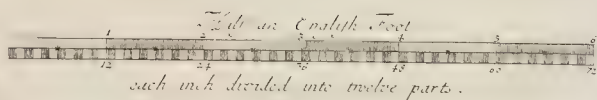
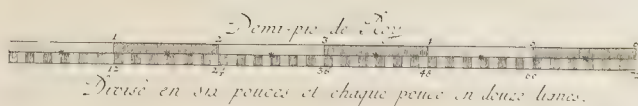
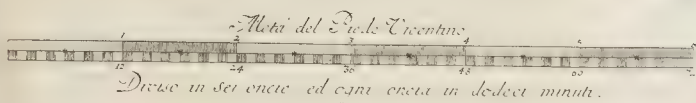
The largest Rooms are 1 Square and $\frac{1}{2}$ in height, and the other Rooms 1 Square and $\frac{1}{4}$.

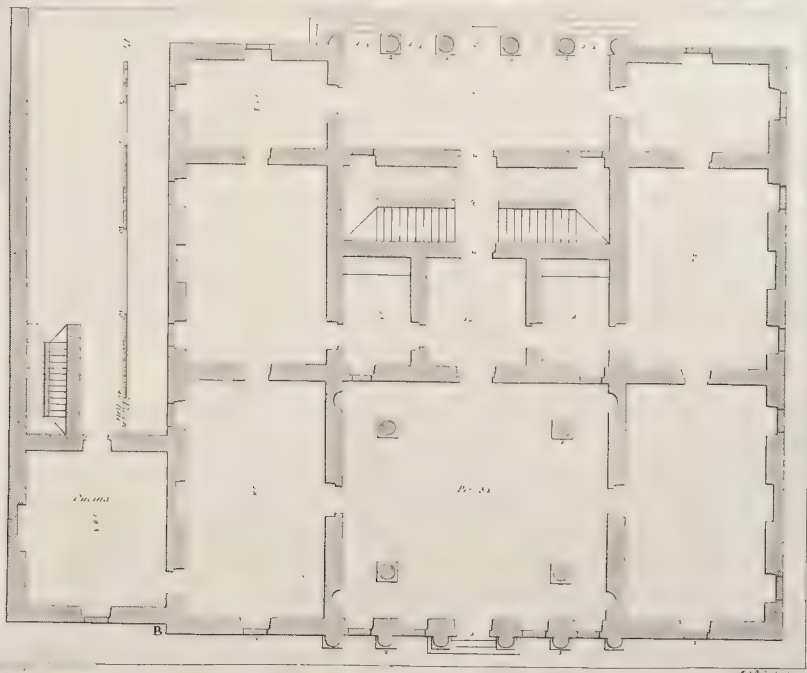
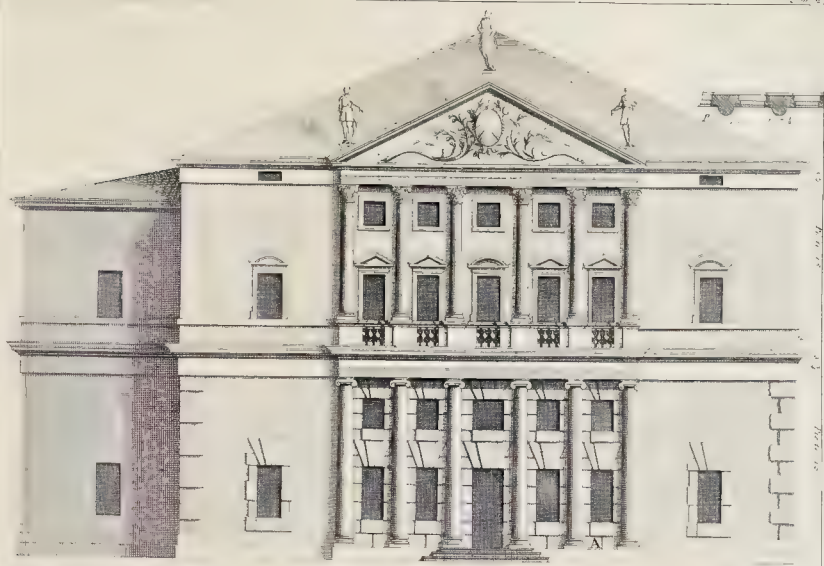
The invention of this Portico is taken from the Temple of *Trevis*, Plate 75.

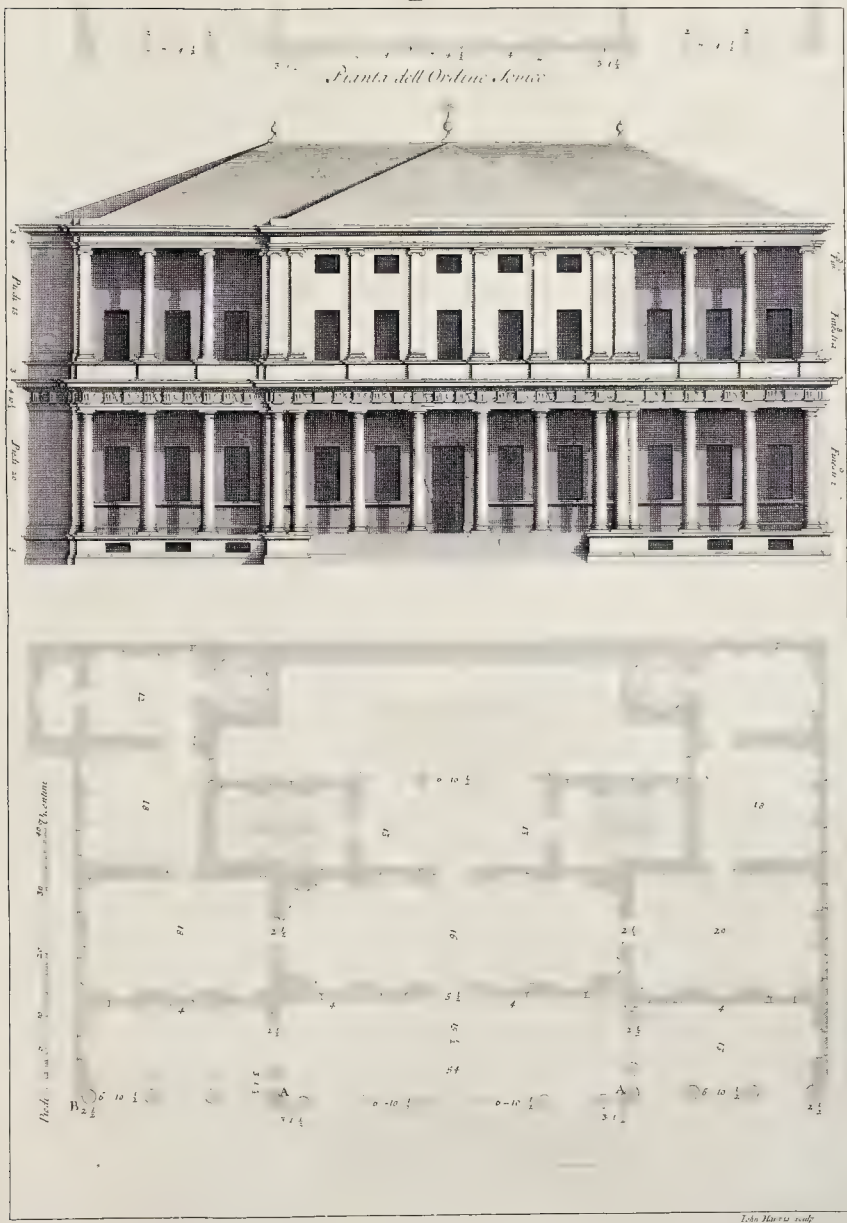
I have made a general observation, that all the Buildings following are but of one Order, the Stair-cases are generally the same;

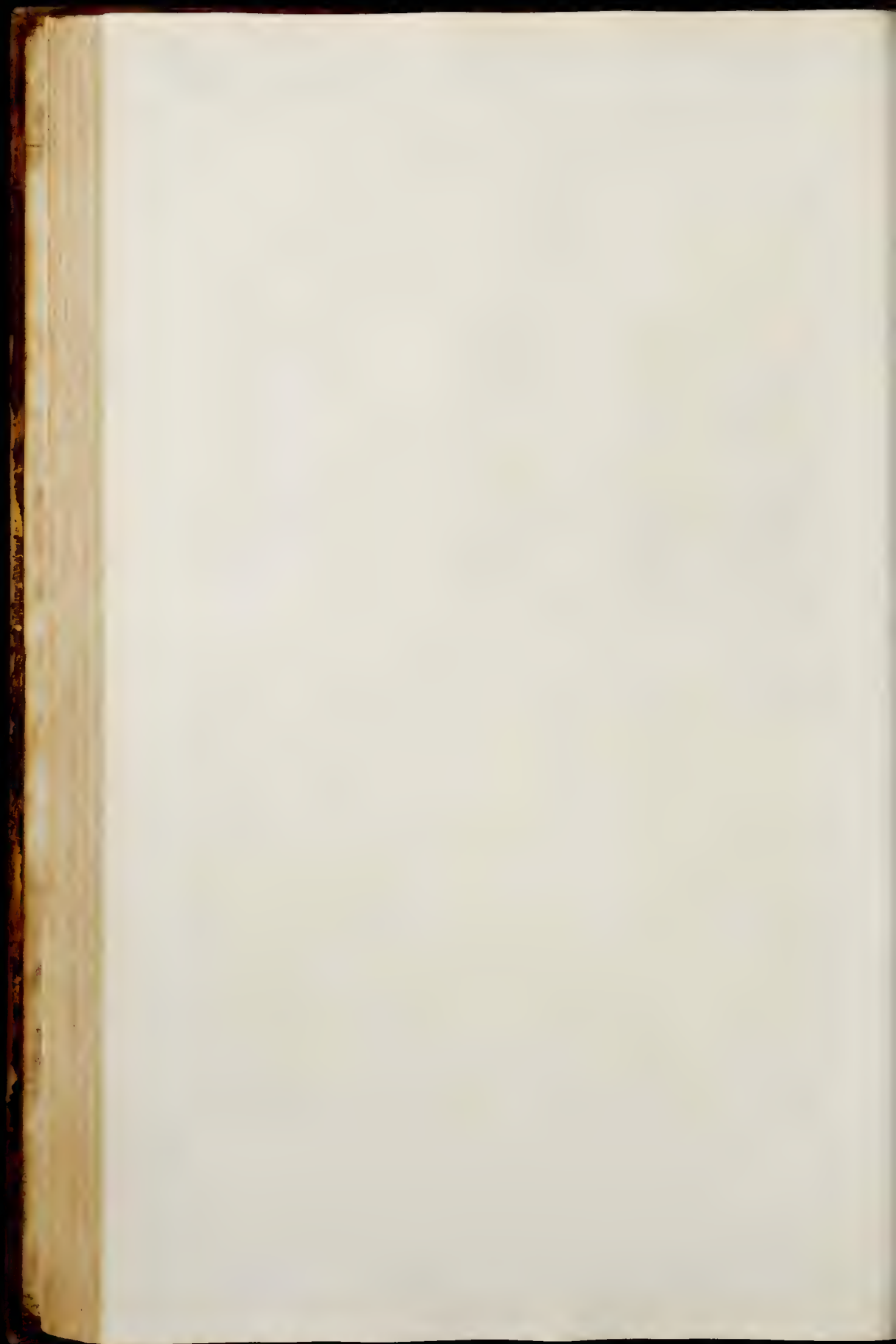
- same; but to the Building of the two Orders, which are adorn'd, the Stair-cases are to be lightome and commodiously placed.
- PLATE XXXIII. A. The Columns of the Lodges are of the *Ionick* Order.
- B. The Frontispiece of the Portico looks very well, and makes the middle part of the House more in height than the two sides.
- C. The Cornice with the Corona ranges all round the Building.
- D. The Pedestals are 5 Feet high, and serve for a Basement round this Building; and at the top of this Basement is the Floor of the Rooms, which Rooms have all a flat Ceiling.
- Above this is the Granary, and underneath is the Kitchen and other Offices.
- PLATE XXXIV. A. The small Rooms near the Lodge are arch'd a Fascia.
- E. The great Rooms are high, according to the second manner of arching.
- C. The square ones have the Lunette in the Angles over the Windows.
- D. The Hall is likewise arch'd a Fascia.
- B. The Arch of the Lodge is as high as the Arch of the Hall, and both are as high as two Stories.
- F. The Basement all round the House, and all the Rooms are arch'd.
- PLATE XXXV. This Building rises from the Ground 11 Foot, and underneath is the Kitchen and other Offices; all the Rooms below and above are arch'd.
- PLATE XXXVI. The Fountain A. is cut out of a Rock. The Pavement of the first Story is even with the Court B.
- C. The Front, has four Columns of the *Ionick* Order with their Architrave, Freeze, Cornice and Pediment.
- D. The *Ionick* Capitals of the two Angle Columns have two Fronts. See Lib. 4. Plate 37.
- E. This Building has two Stories.
- PLATE XXXVII. The small Chambers and out-ones are of an equal breadth, and the Arches are two Squares in height.
- PLATE XXXVIII. The Stair-cases A. are put in the hindermost part of the House, to avoid Cold and Heat.
- PLATE XXXIX. The great Chambers B. are 21 Foot high, and arch'd with Reeds for Lightness.
- PLATE XLIV. A. This Lodge not begun. B. This Lodge not finish'd. To the prick'd Line the Lodge is begun, the Architrave is of Wood, and the Columns of Bricks; the Building being finish'd low, I do not see how it could have been finish'd with the upper *Corinthian* Columns, I dare say this was done without the Consent of the Architect.
- PLATE XLV. The circular Lodge looks well, by reason that the Cupolo is seen above the Pediment of the Portico.
- PLATE XLIX. The Gentleman that owns this House did use me exceeding kind, and he himself went with me and shew'd me all the Building.
- This House is finish'd to the prick'd Line A.A. and no more; all the rest is old Building.
- B. The great Lodge should have been arch'd a Mezza botte.
- C. There is none of this House or Villa that is rais'd in the Wings 160 high, but only this; because the principal Front was not seen to the Road.
- D. This Lodge receives its Light at the Ends and over the Roof of the lower Buildings.
- PLATE L. Scamozzi has imitated this Villa. See Fol. 281.
- PLATE LI. A. This Intersecation of the two Lines shews the Bigness of the great Rooms over the under ones.
- B. These Rustic Columns are suitable for this Villa.
- PLATE LII. A. These double Columns are better than if it should have been one Column and a Pilaster, as I have often seen used in Buildings.
- PLATE LIII. A. The putting out of the Landing-place of the Stairs farther than the Range of the Rooms is to make them easy and light; this Method should be imitated by all Architects.
- PLATE LIV. This Design of *Palladio* never was put in execution, but drawn by the Request of some of his Friends.
- It is a hard thing in suit of the Difficulty to accommodate the Chambers and other Places, that they may have Proportion and Correspondence one with another.
- PLATE LV. Cellars and other Magazines of this House were placed under ground. This is a Method never to be imitated. The Apartments that has pitch'd Roofs, the Giblins are to be at the narrow Ends of the Building.
- This Palace is from the Ground to the top of the upper Cornice 68 Foot 6 Inches in height of the *Venetian* Feet, and 79 Foot 7 Inches *English* Feet. The *Corinthian* Order is $\frac{1}{2}$ part shorter than the *Ionick* Order underneath, and the *Composite* Order is also $\frac{1}{2}$ shorter than the *Corinthian*.
- All these Observations *Scamozzi* and *Braggadocio* make their own.
- PLATE LVI. Where is mark'd A in the Plan are Chimney-pieces.
- PLATE LVII. The Pilasters behind the Columns are call'd by *Vitruvius* Parastice, Lib. 3. Cap. 1.
- PLATE LVIII. A. The large Windows are placed at the Ends of the House, to give light to the Hall; besides the Light from the Portico.
- B. The Architrave and Freeze converted into a Fascia looks well; besides, saves Expences.
- PLATE LX. A. The Portico or Lodge is of Pienostilos, with Parastice. This Villa is otherwise order'd; for I saw it, and it is less; and as far as I can remember, the circular Lodges I have not seen.





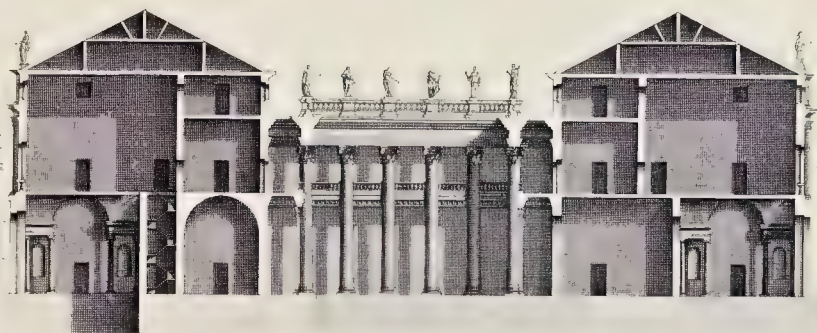




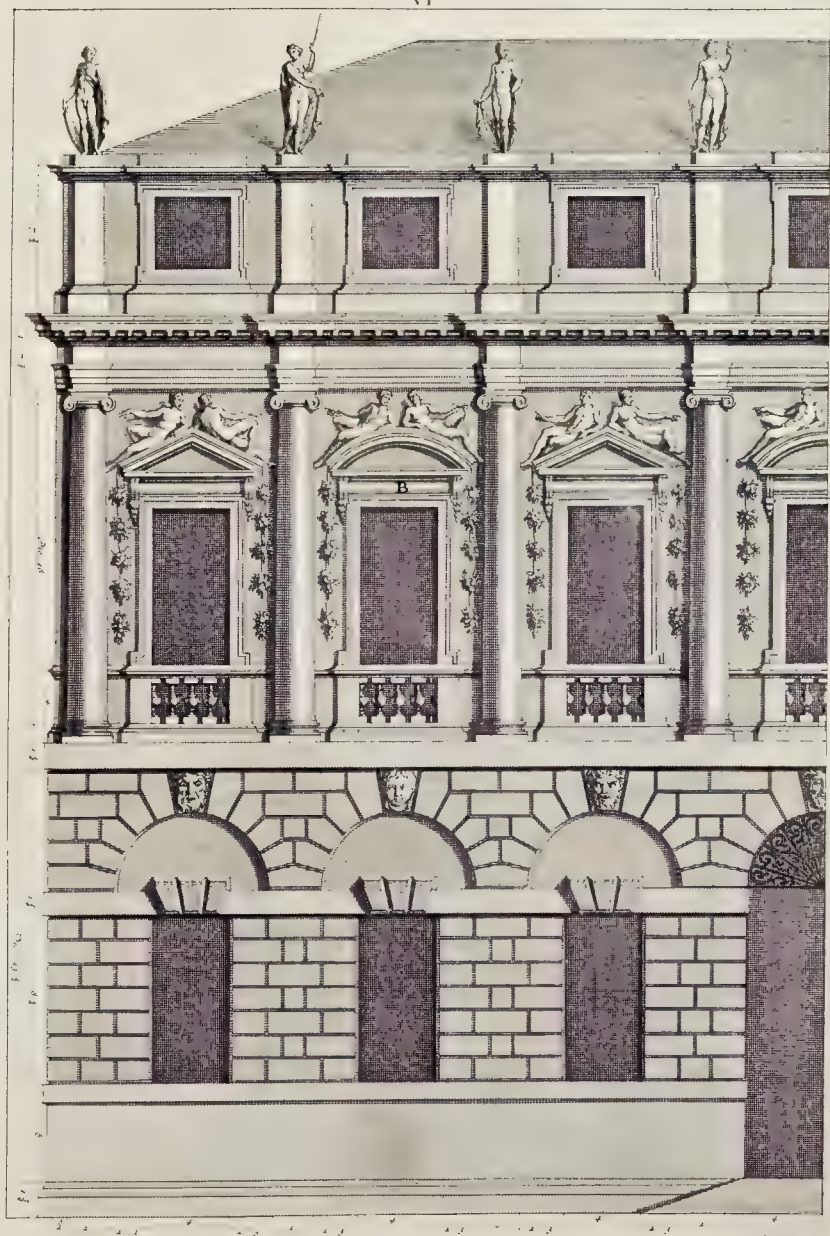


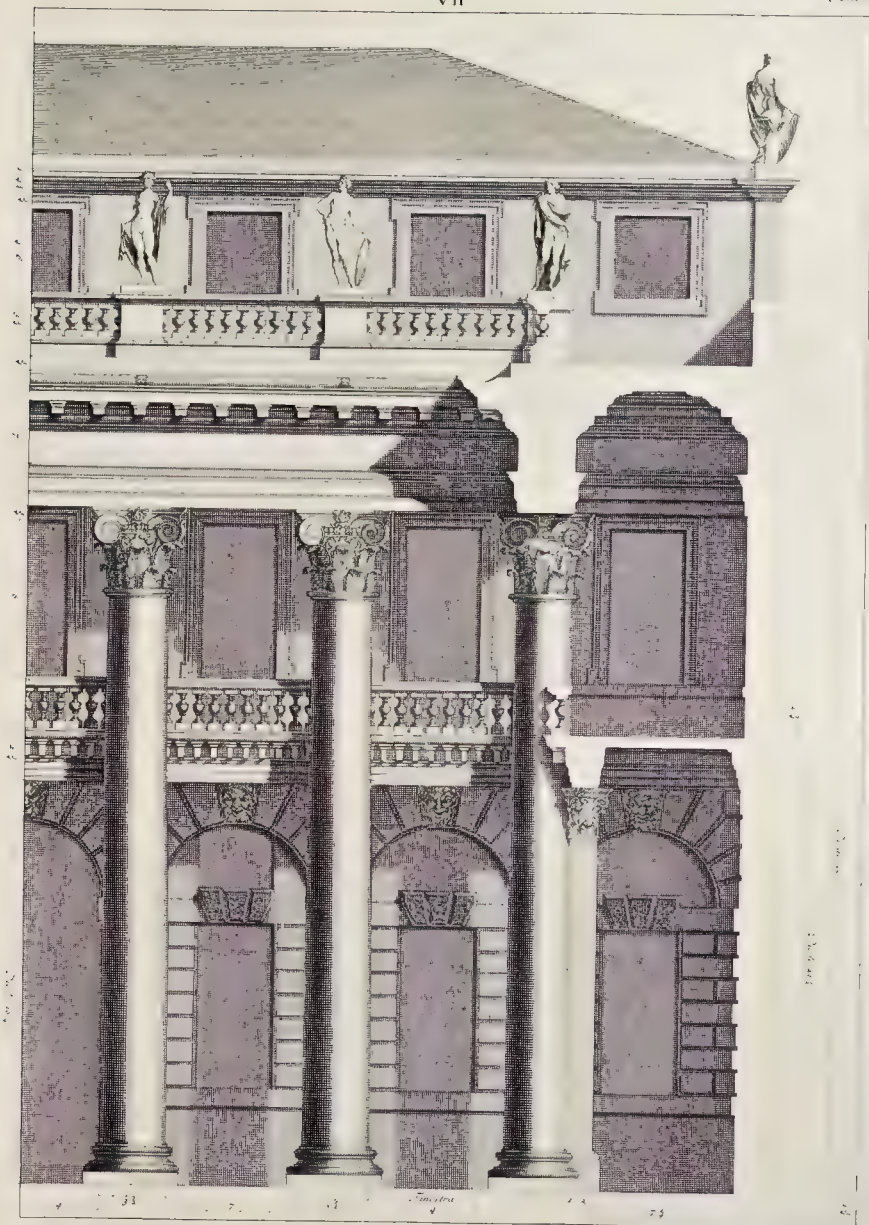


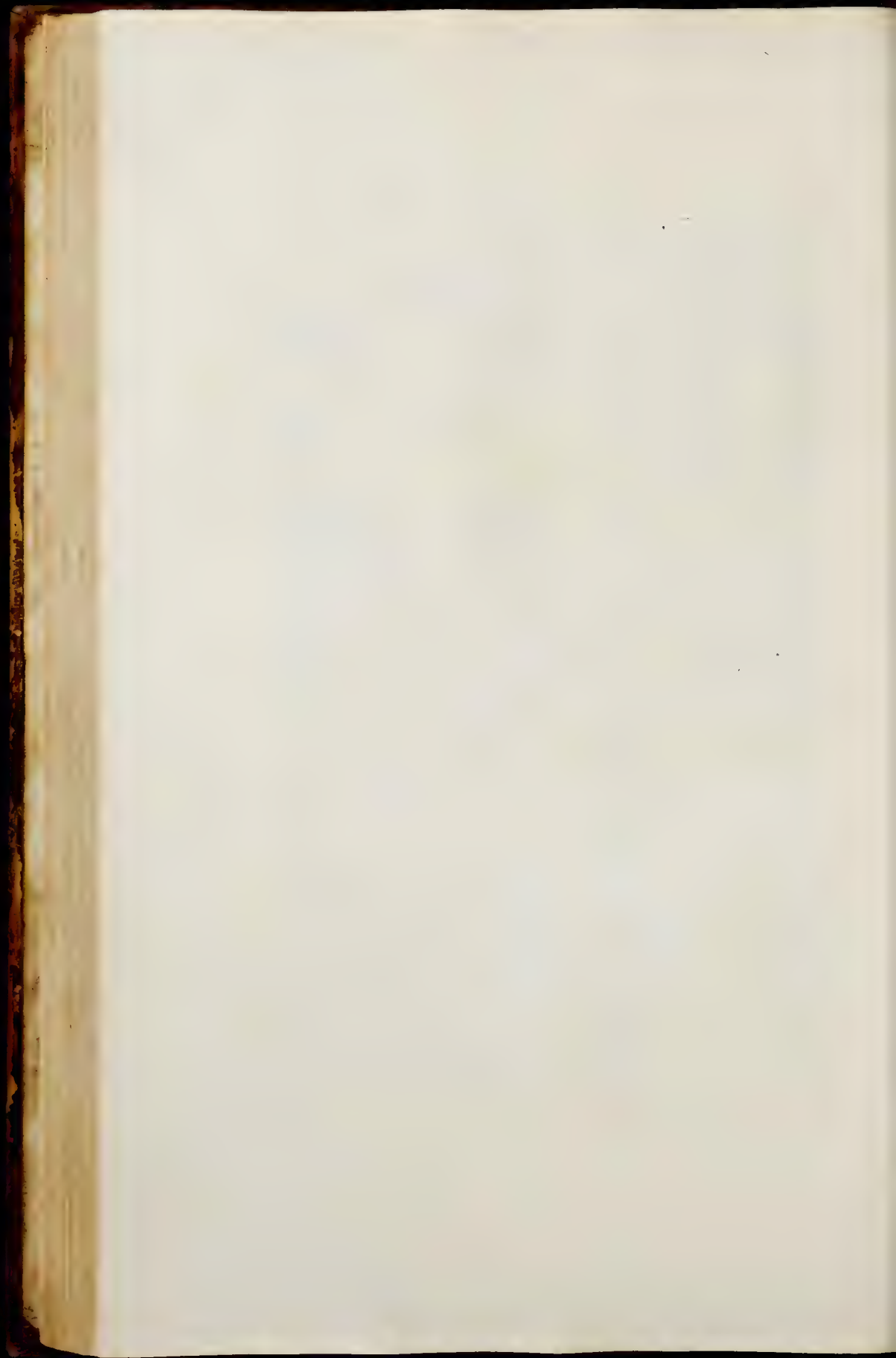




Architectural drawing of a building facade and floor plan.

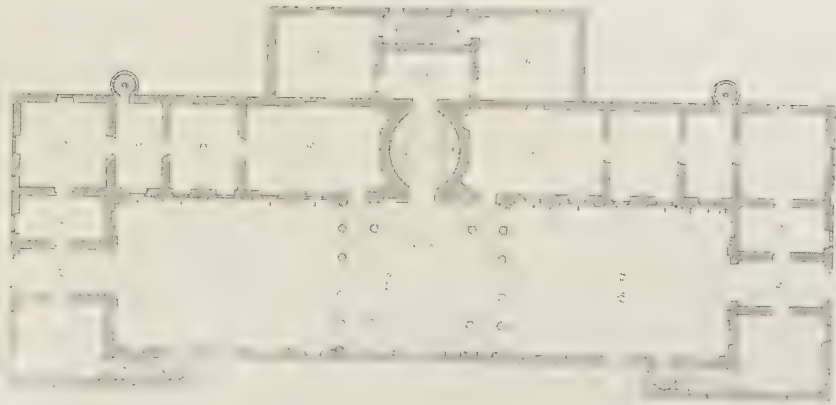






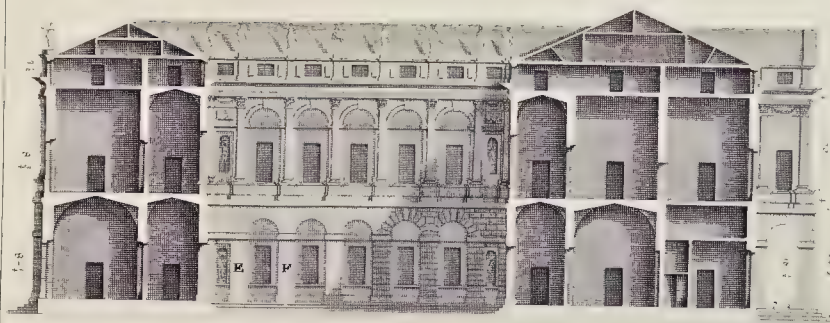


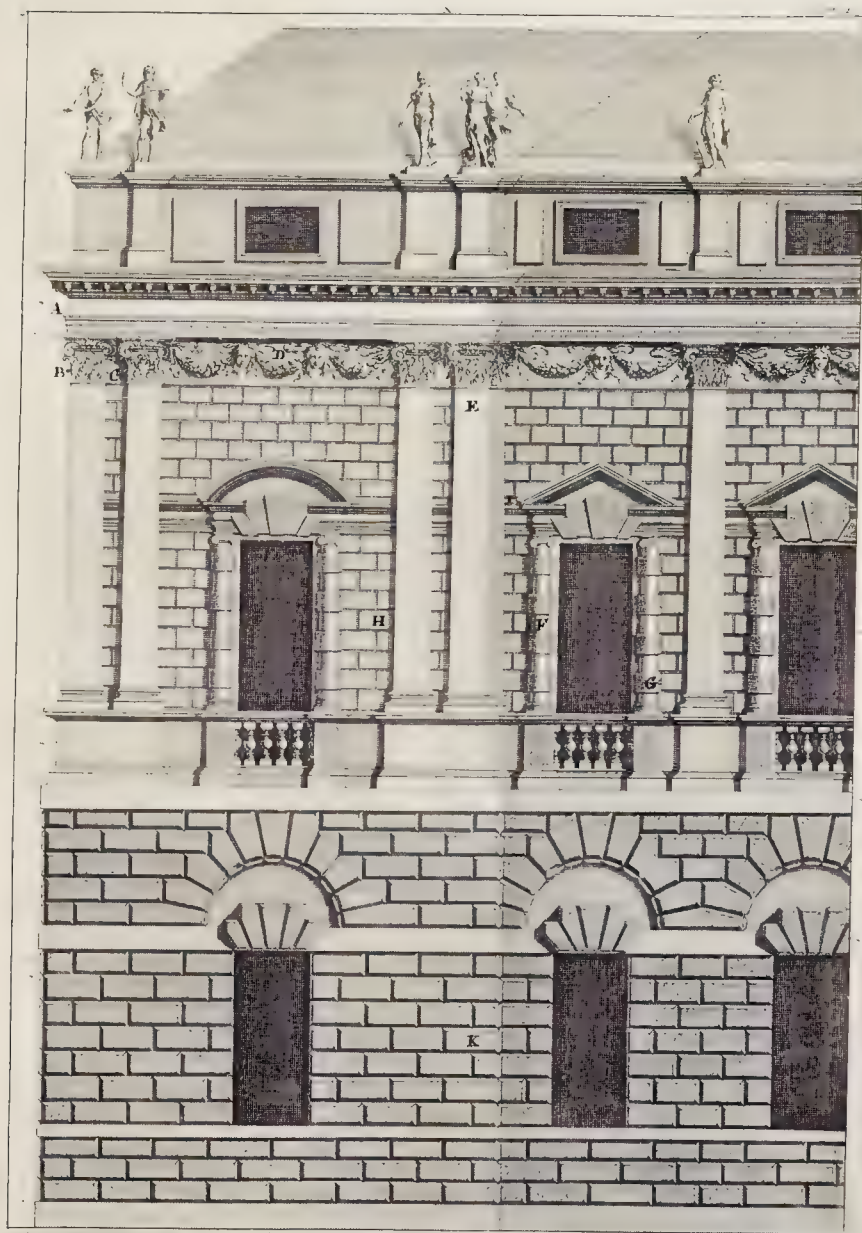
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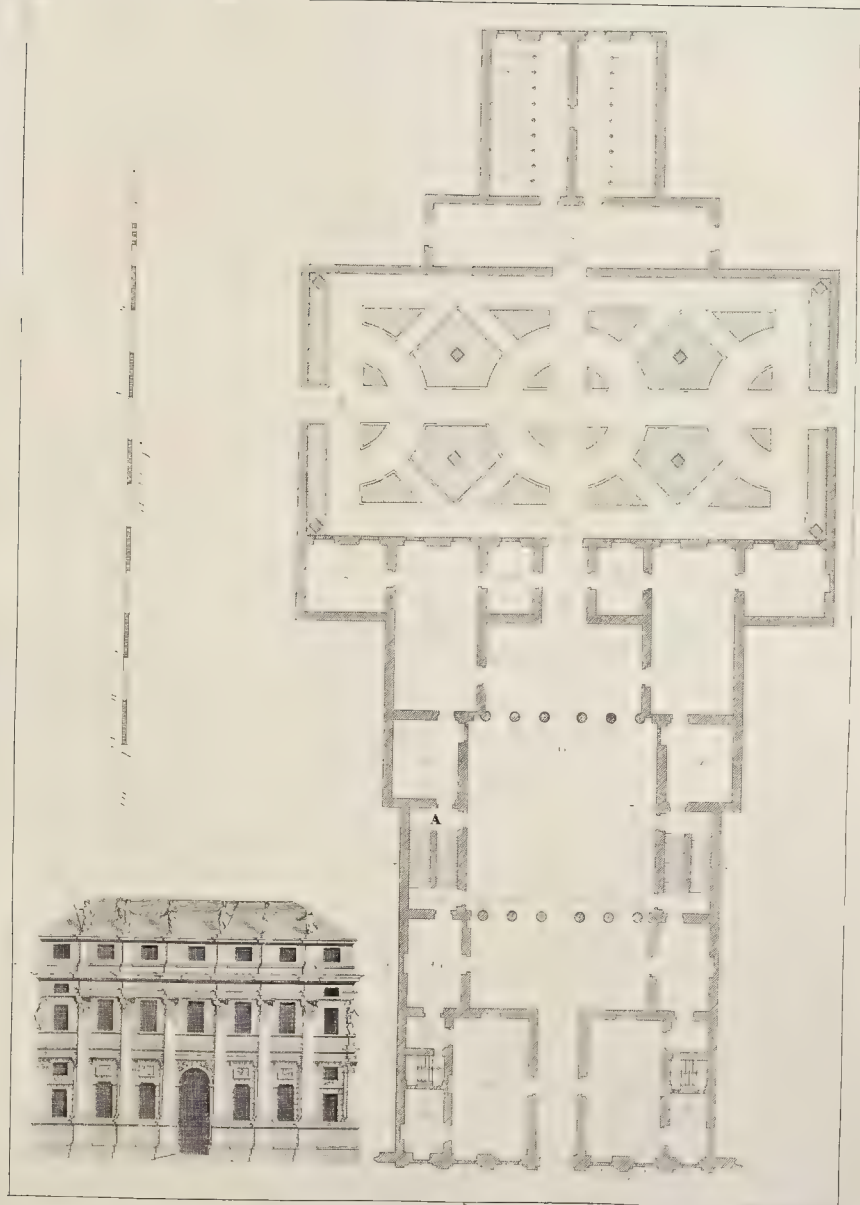


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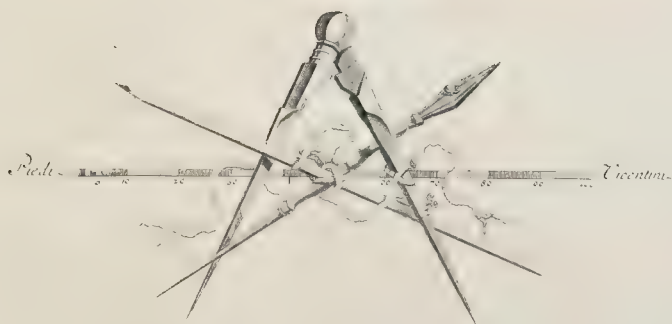
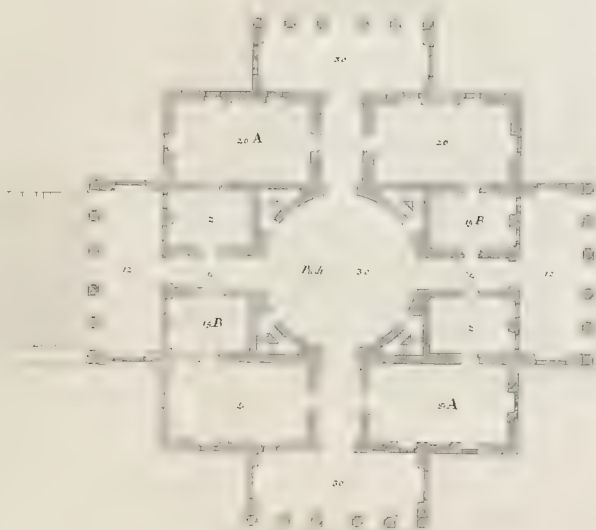


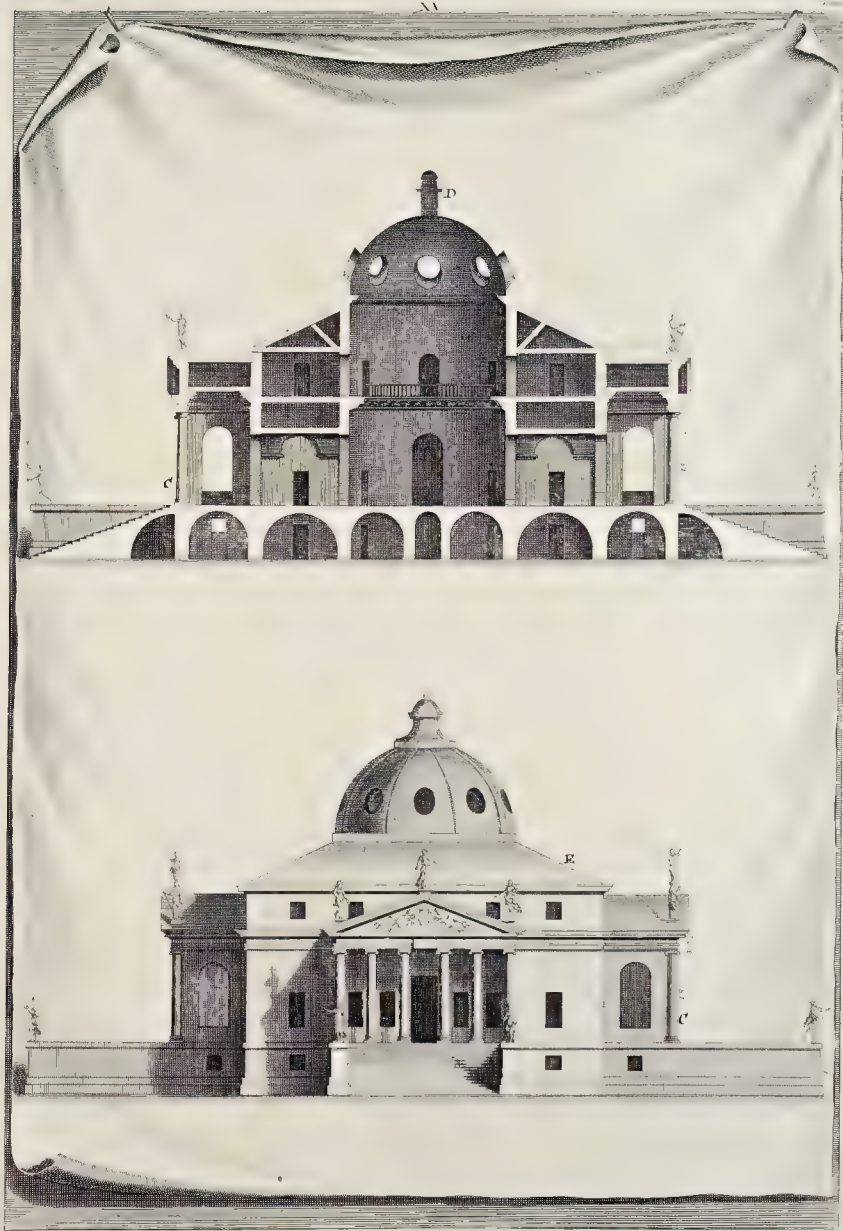


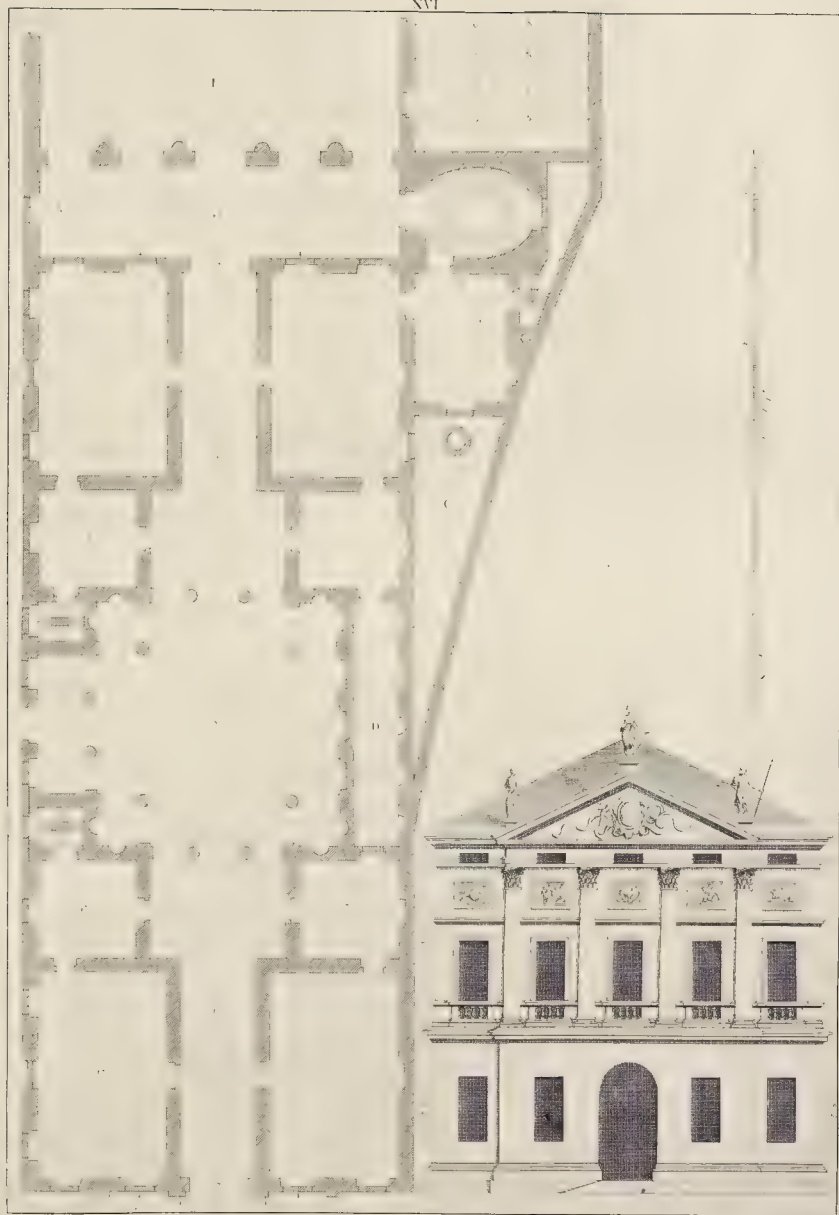




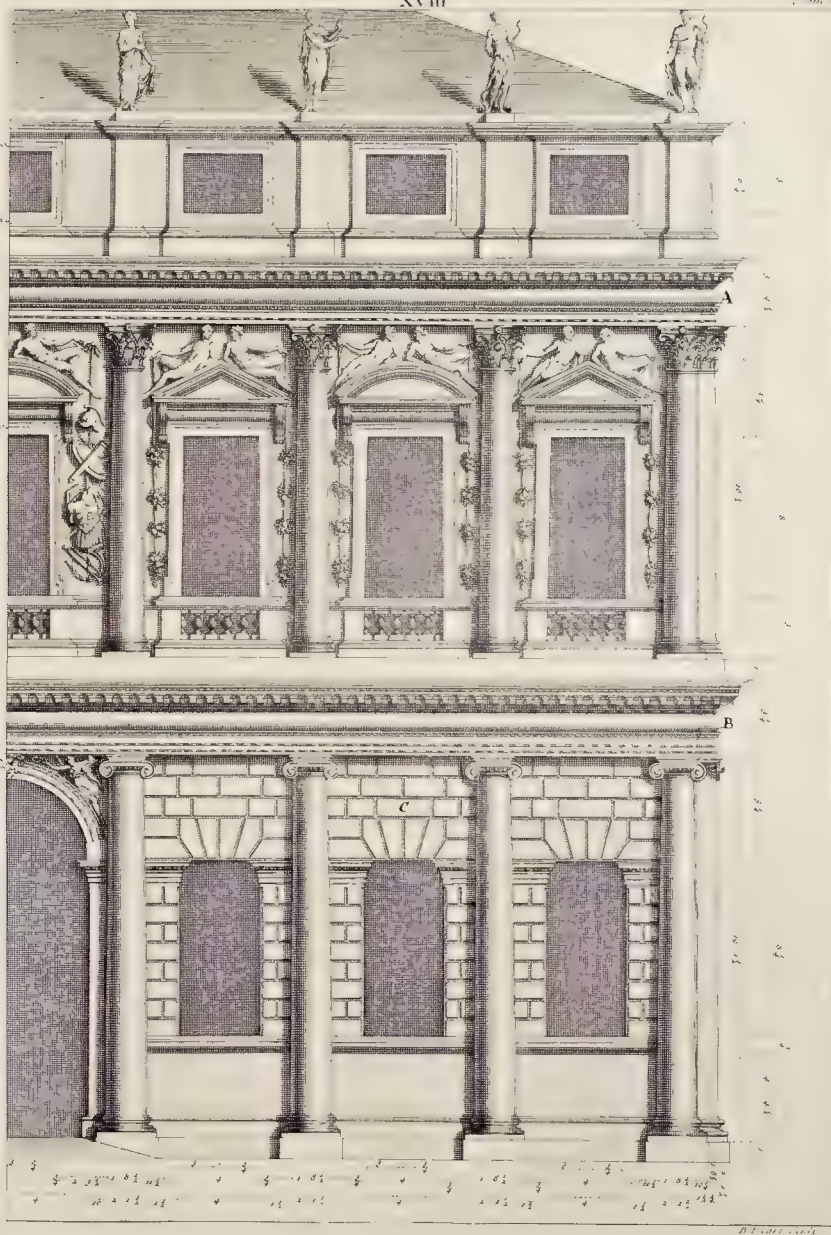


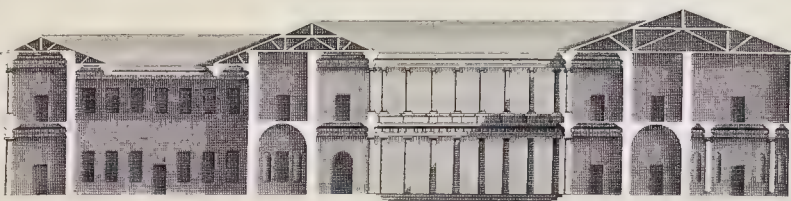
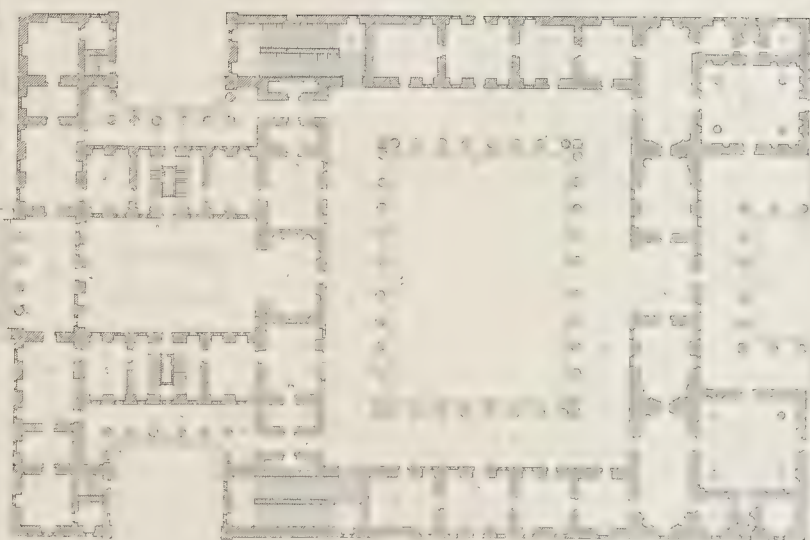


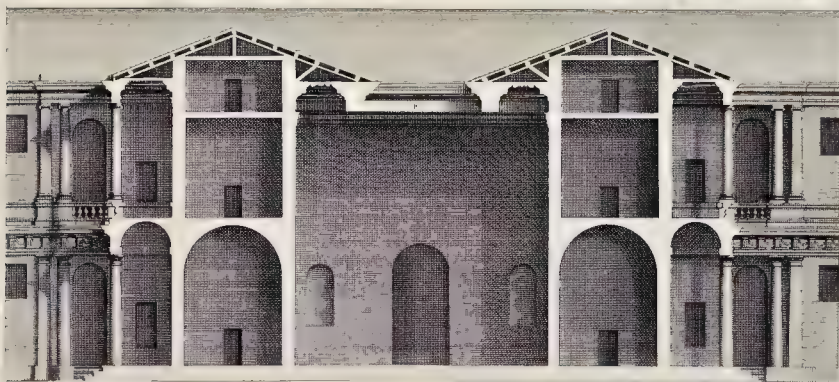
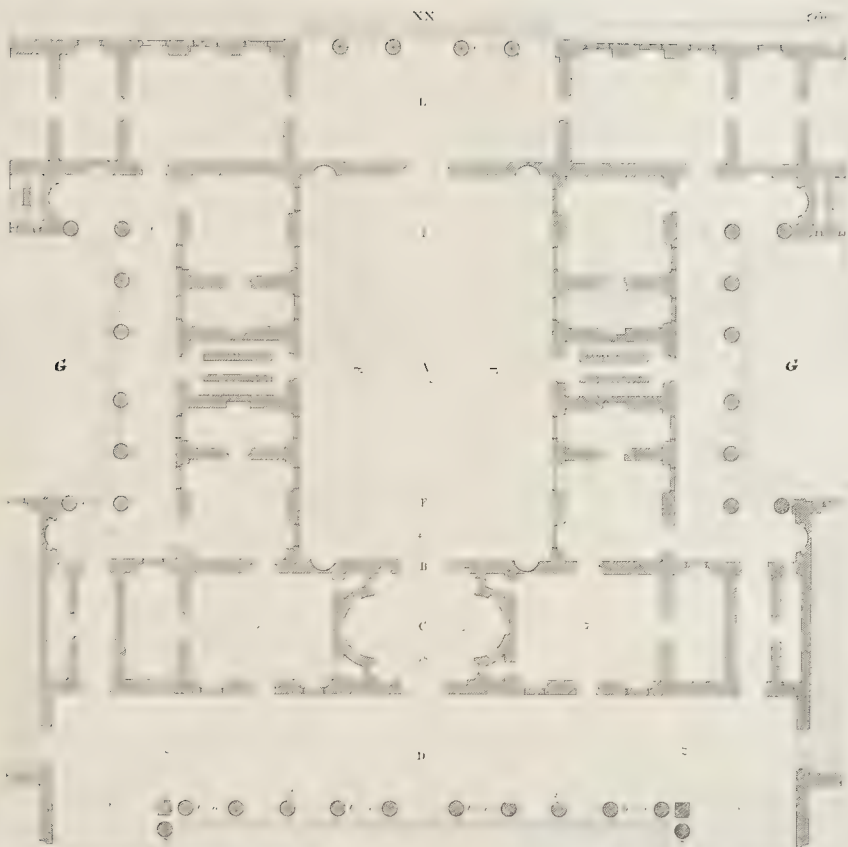


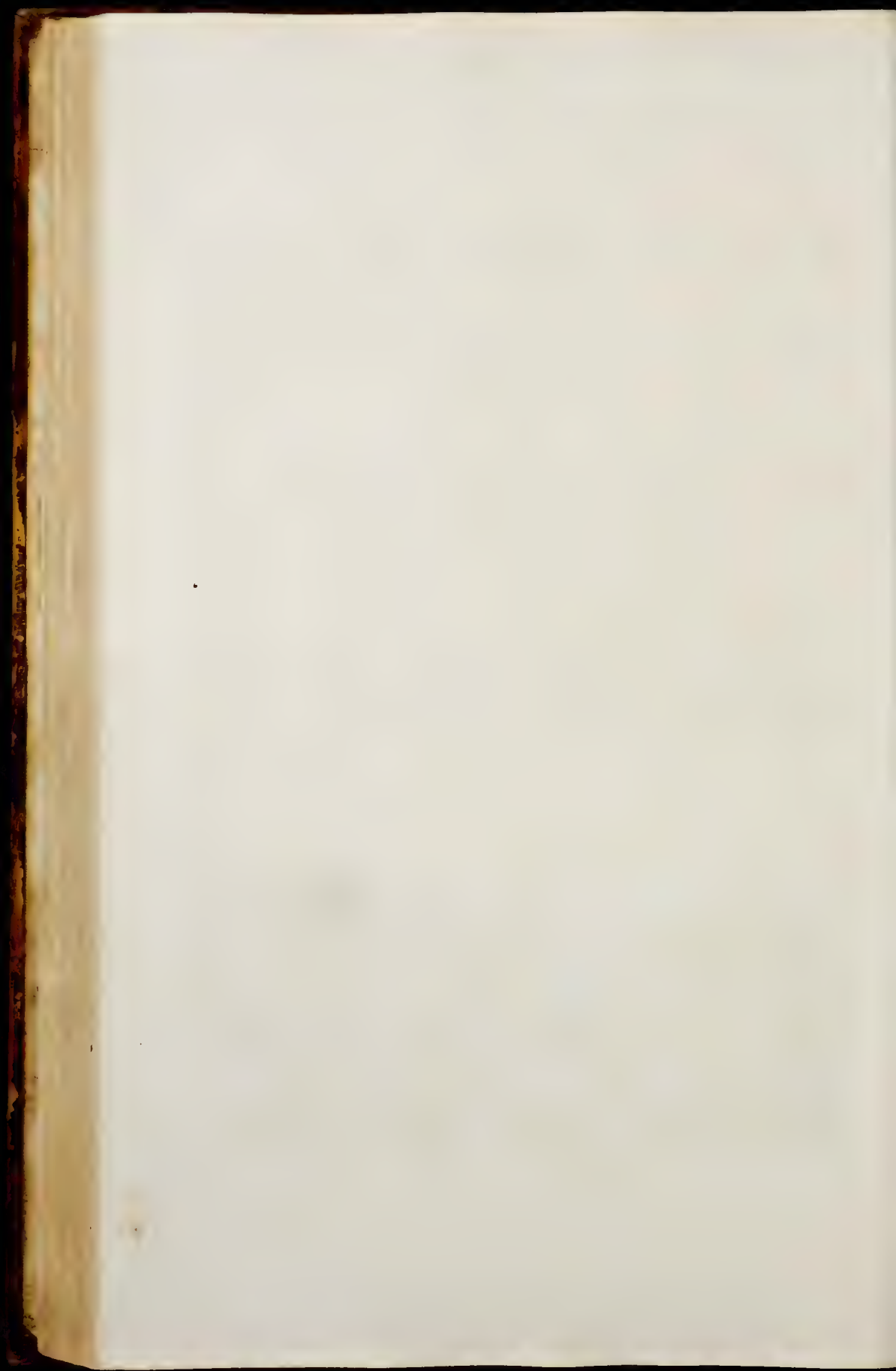


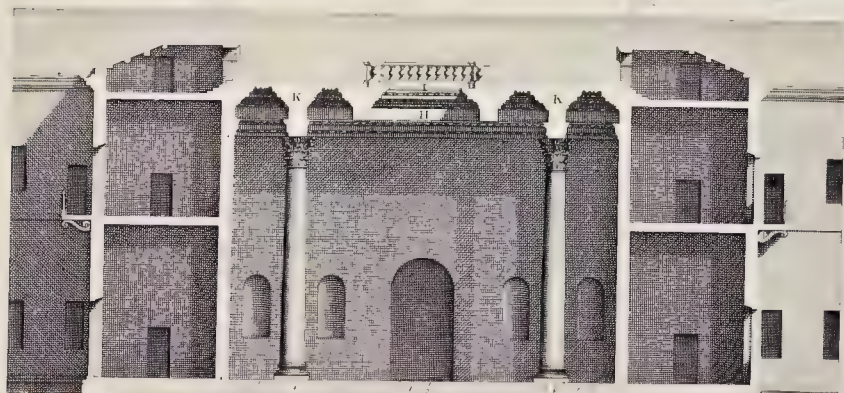
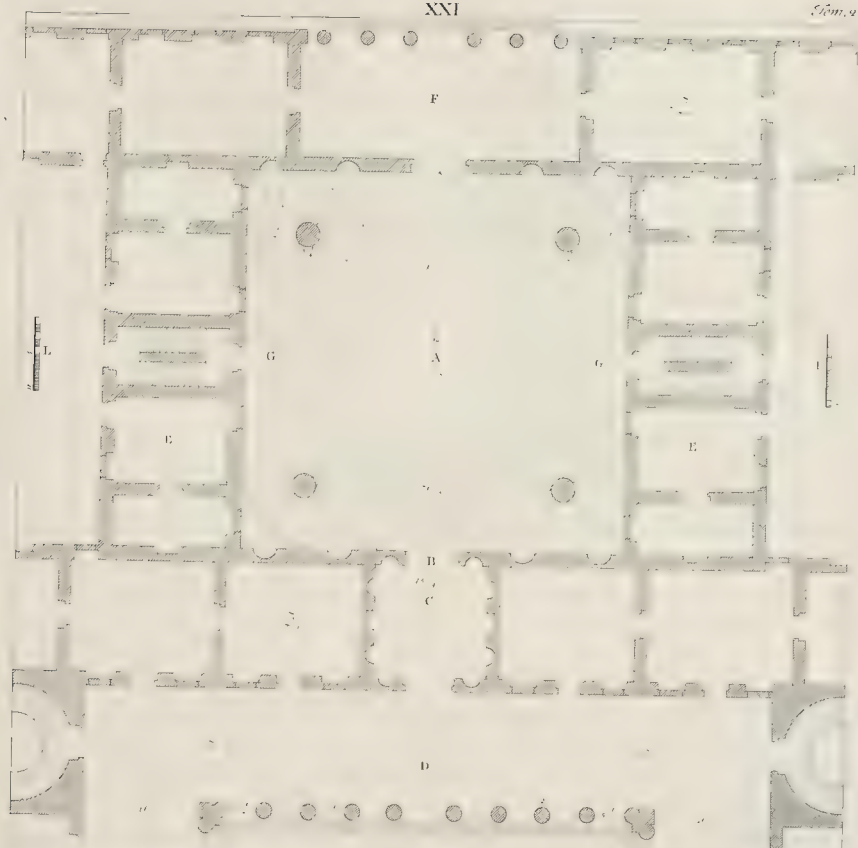


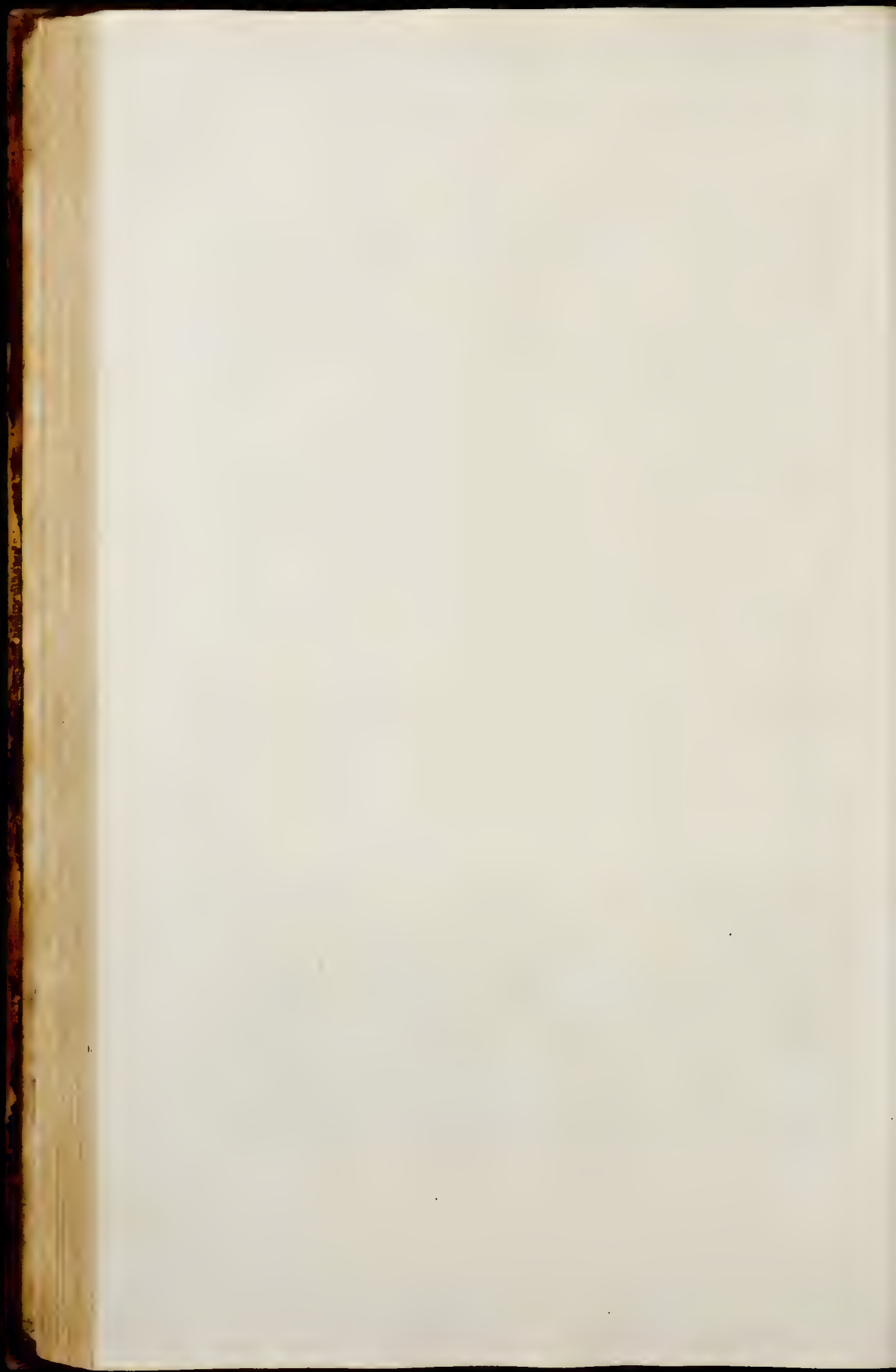


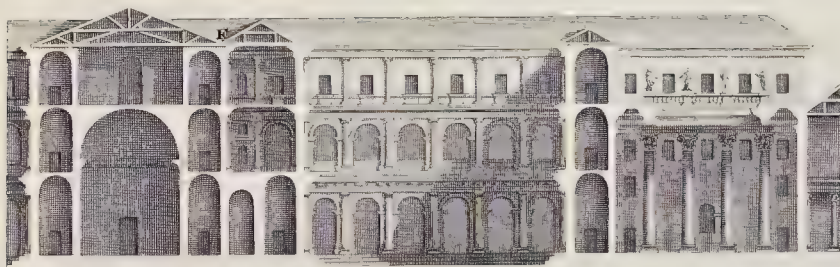


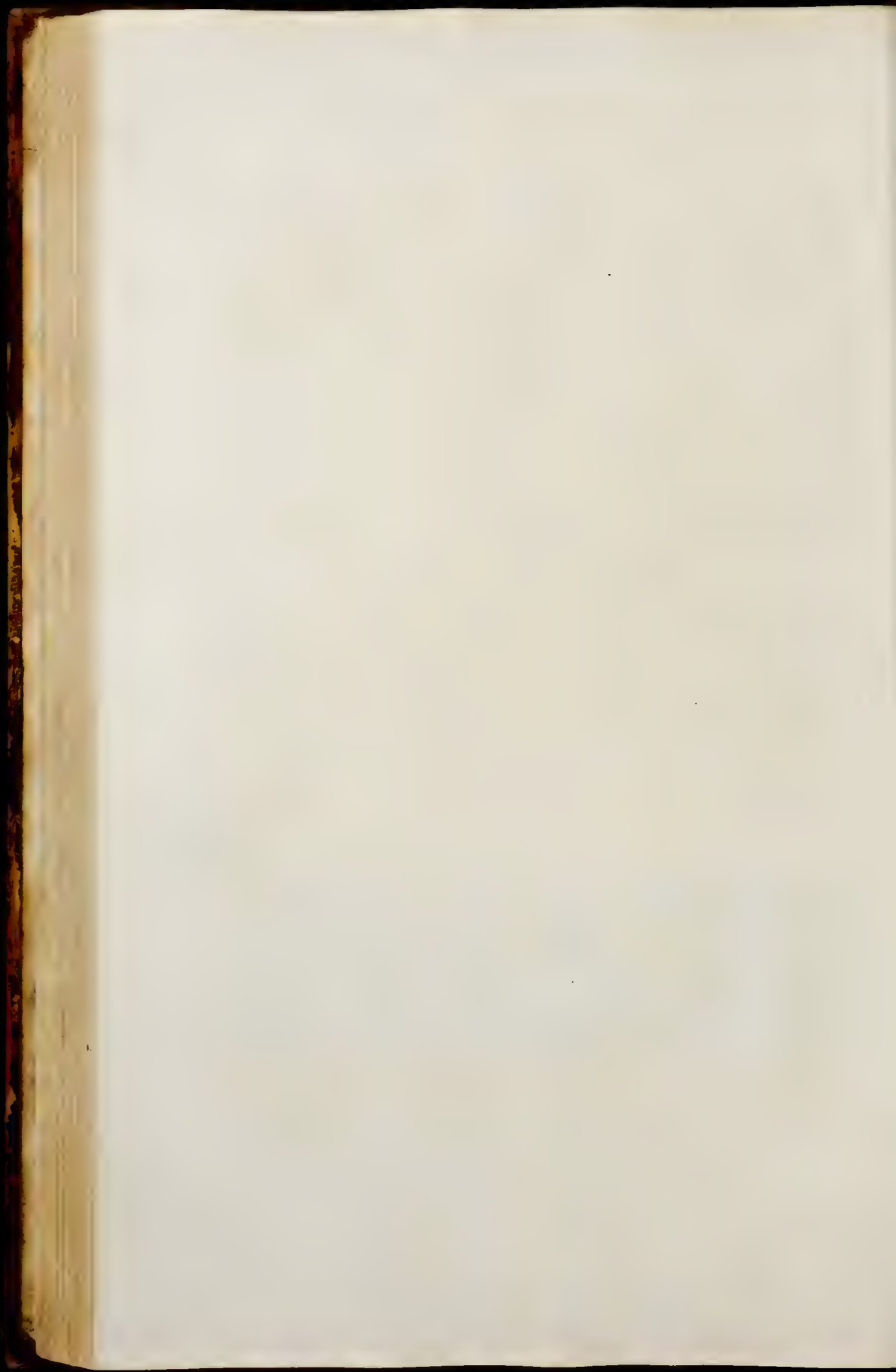


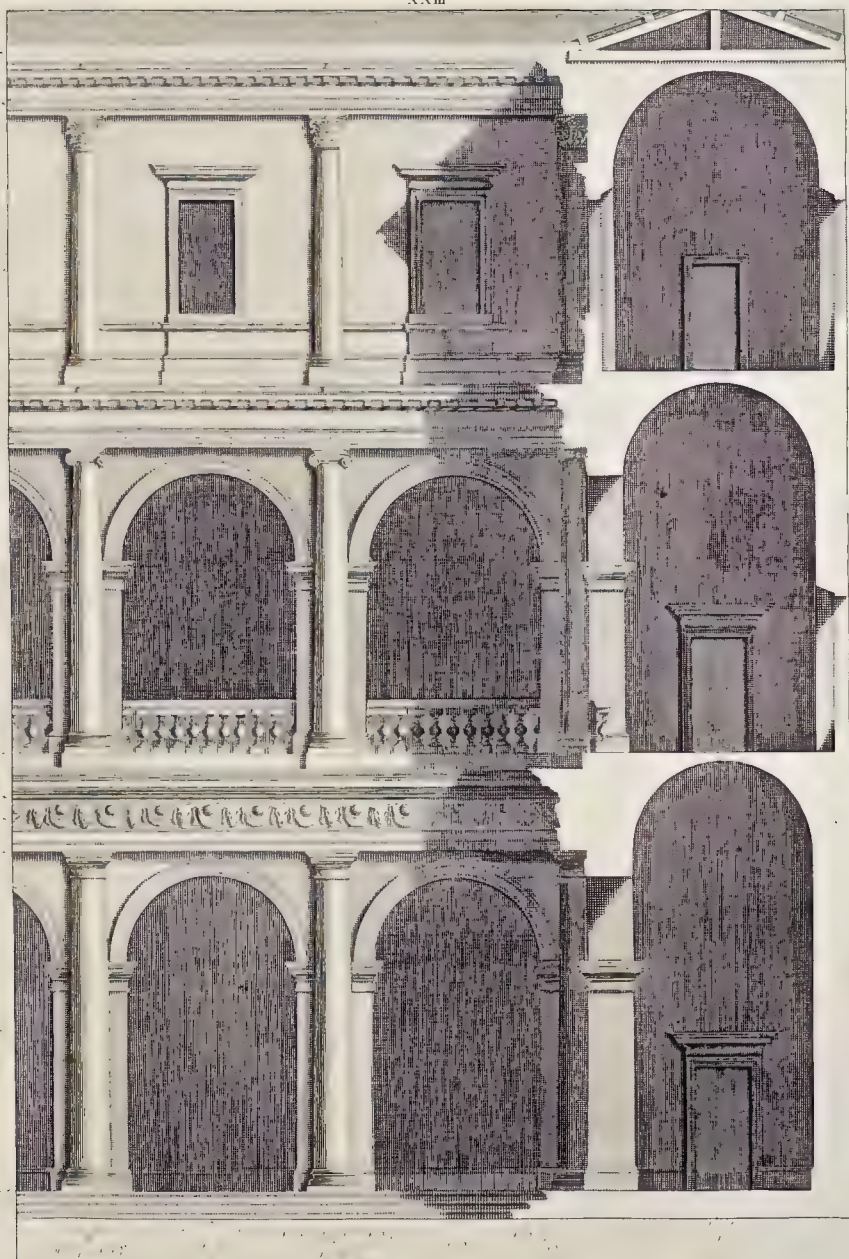


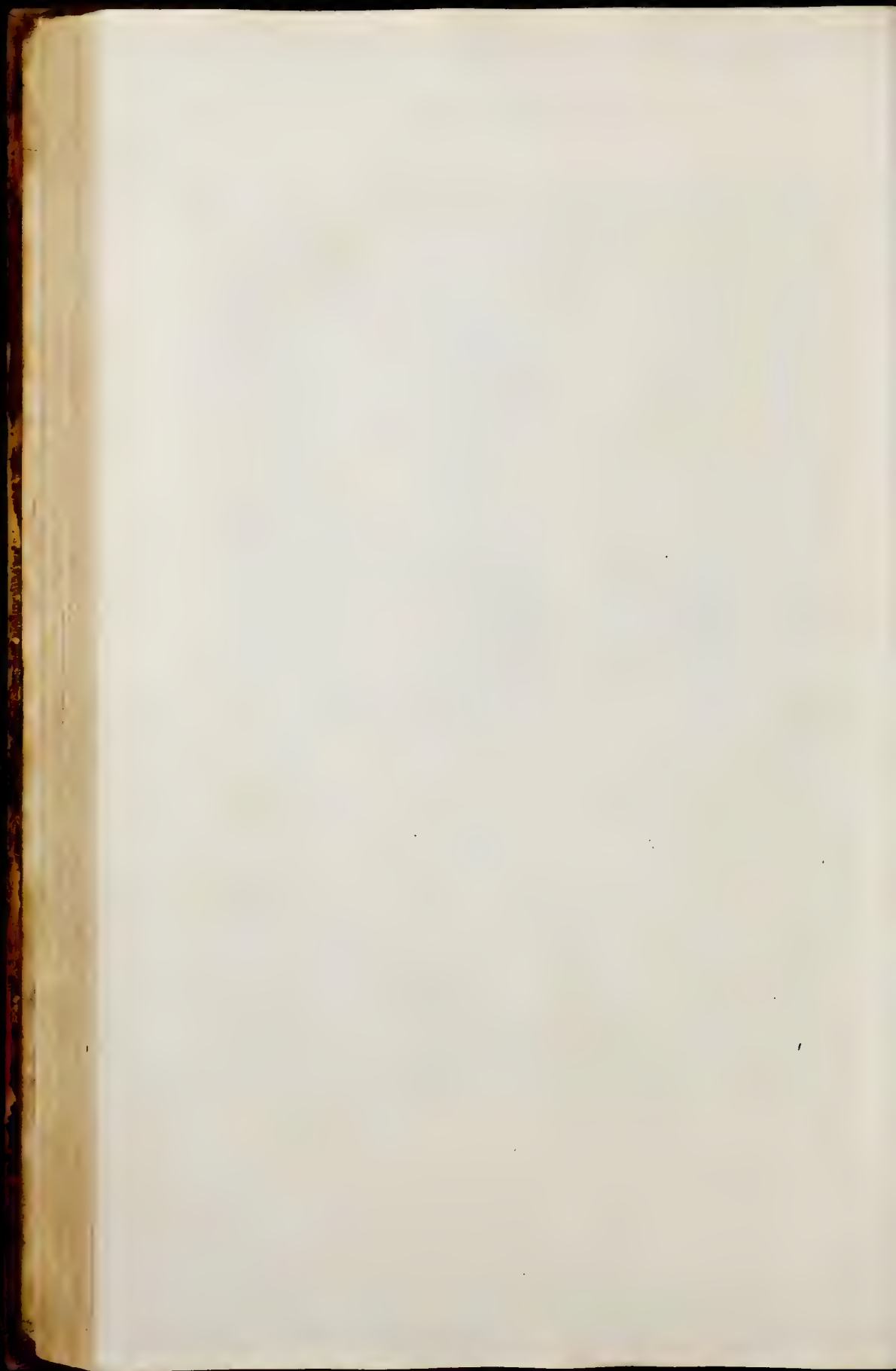


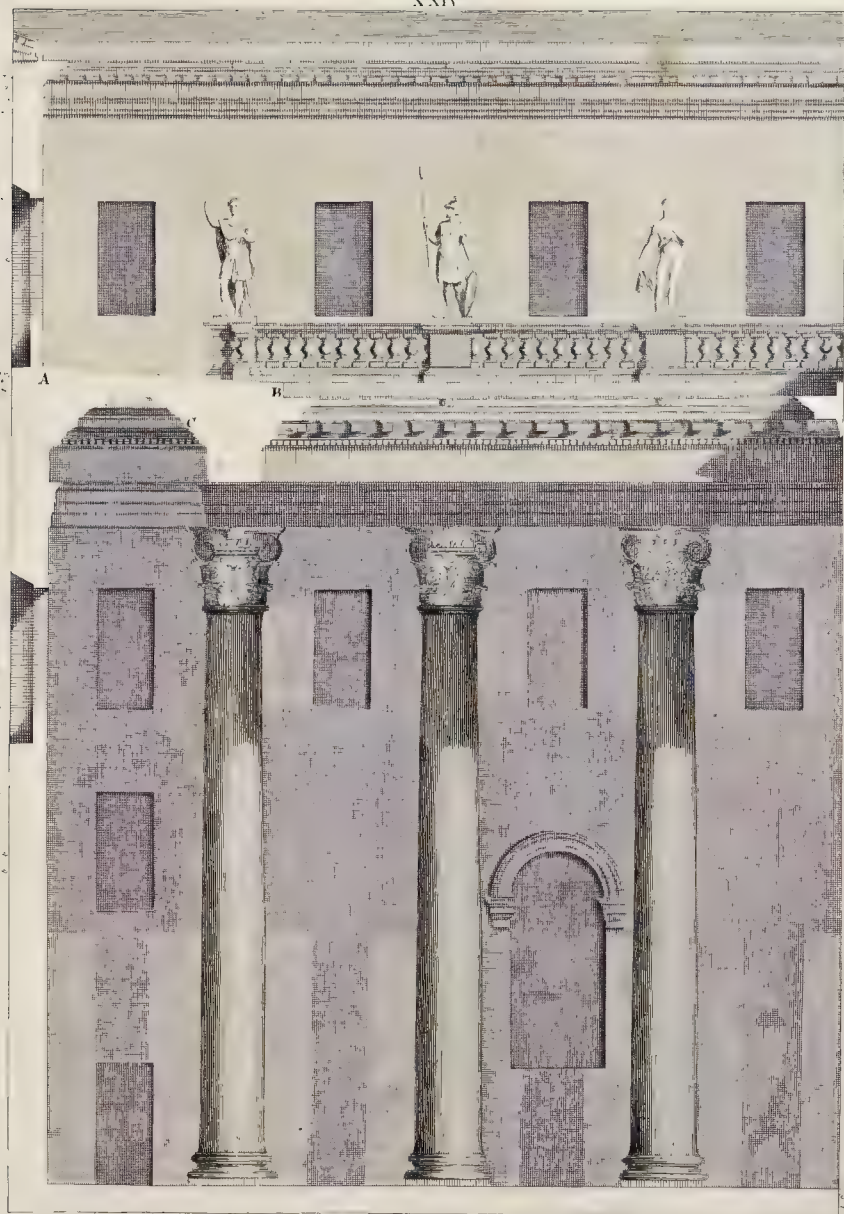




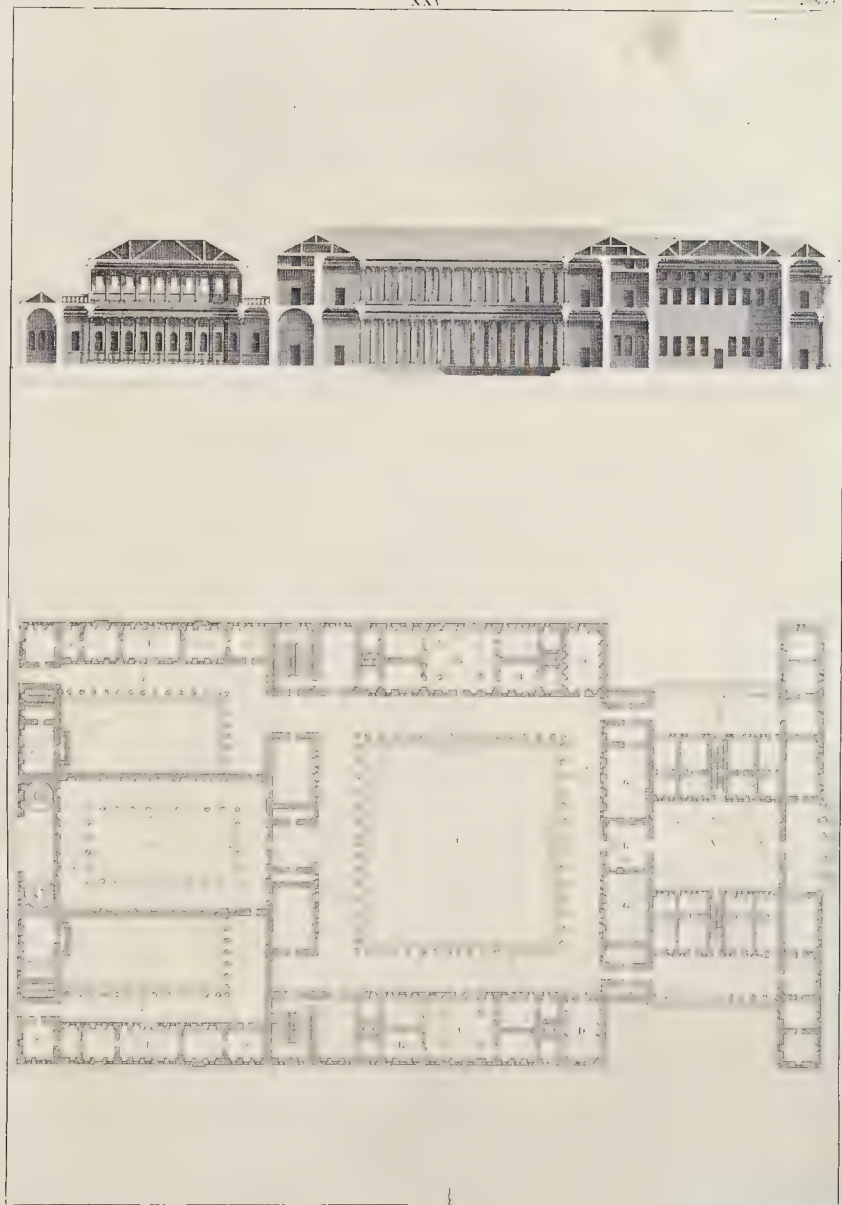






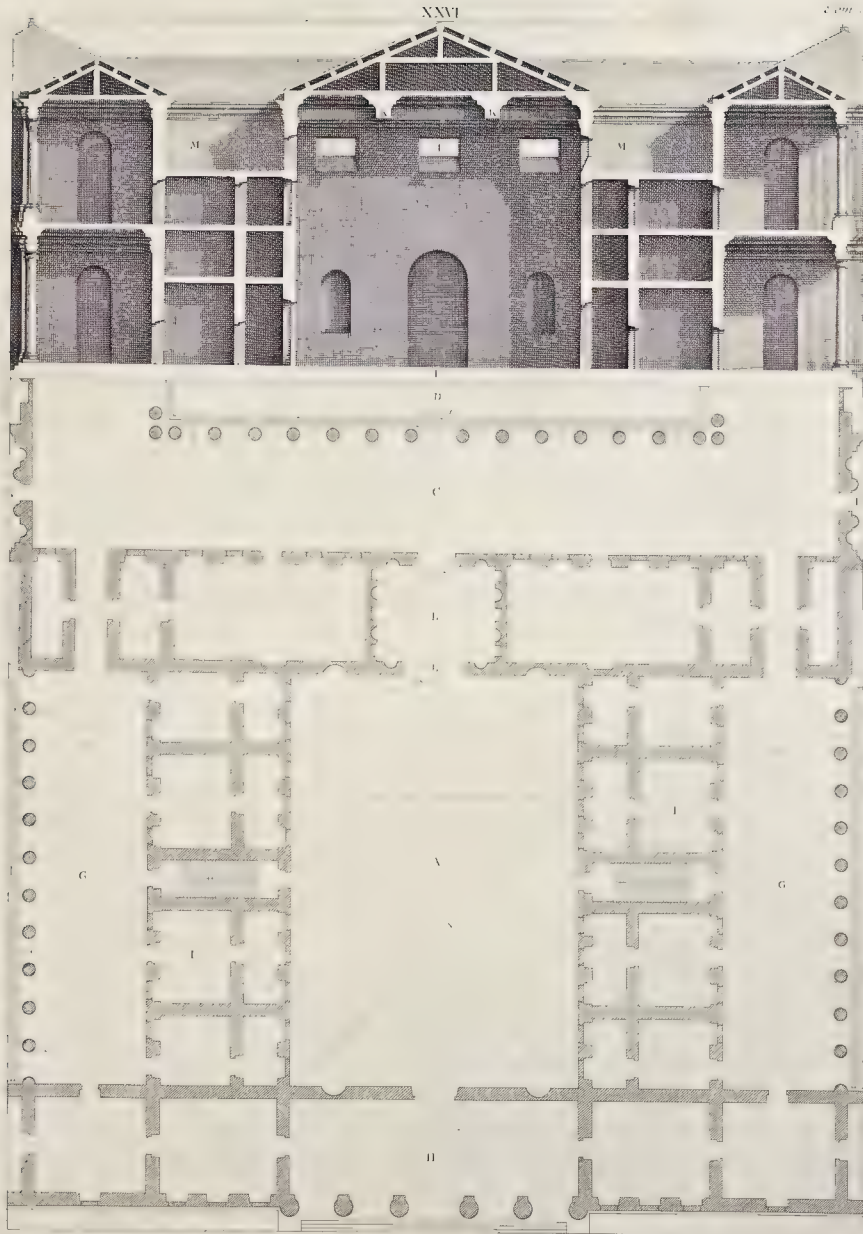


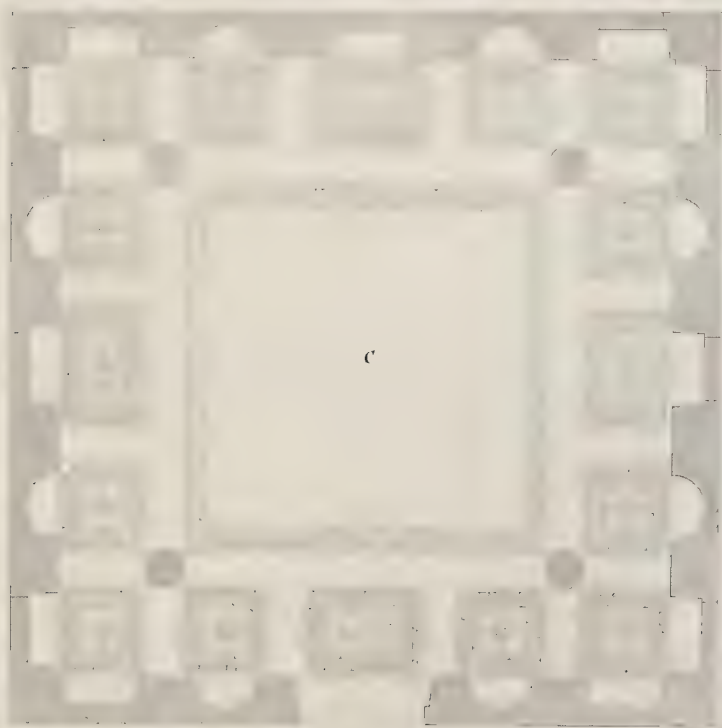


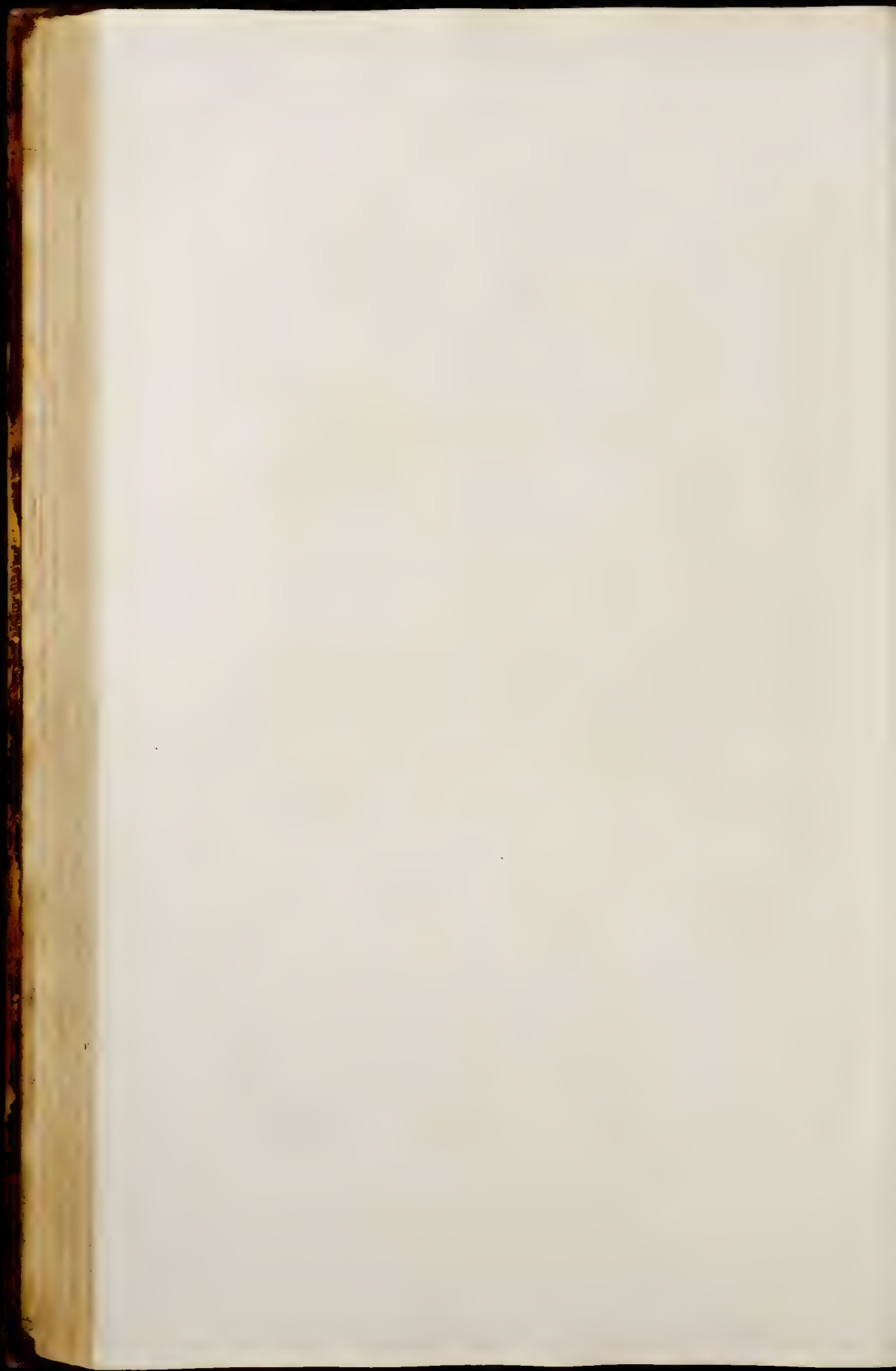


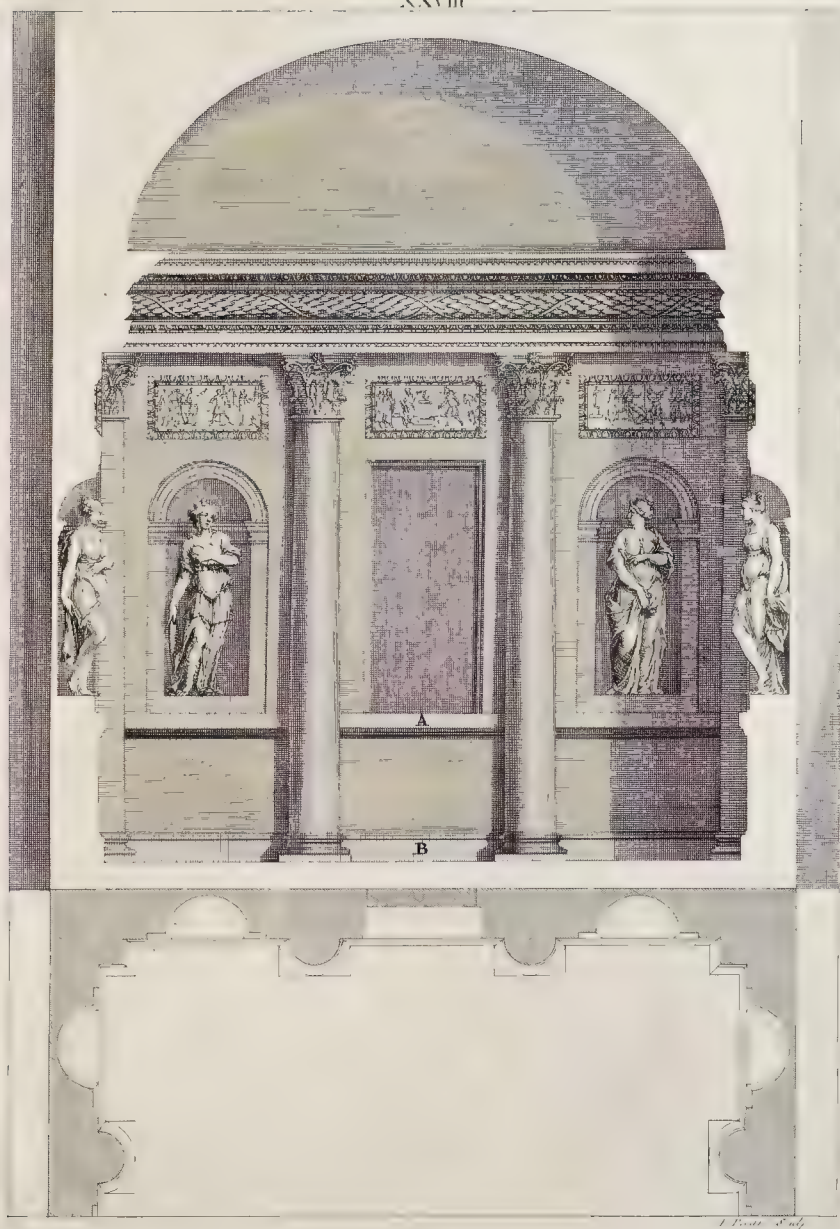
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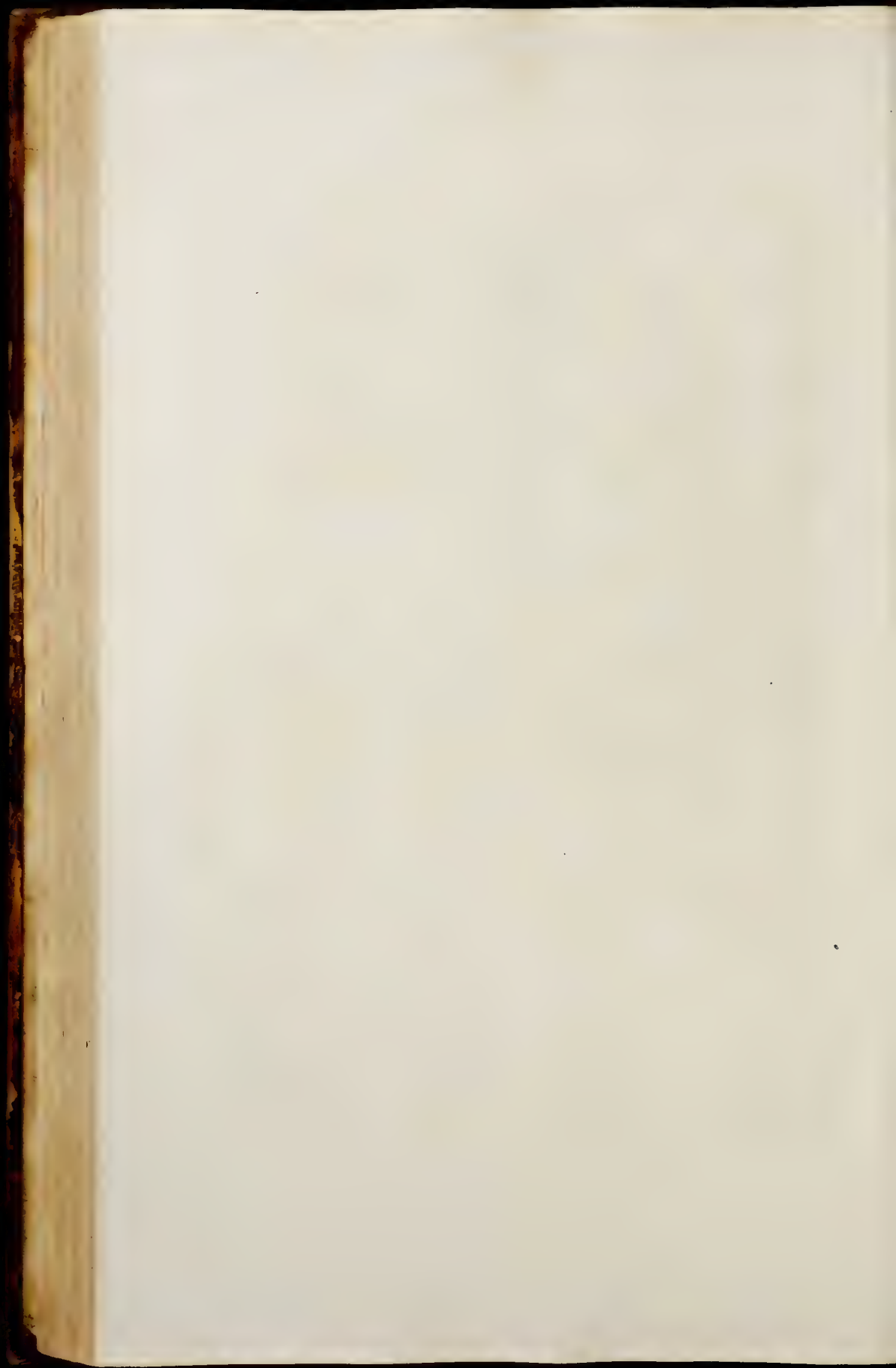
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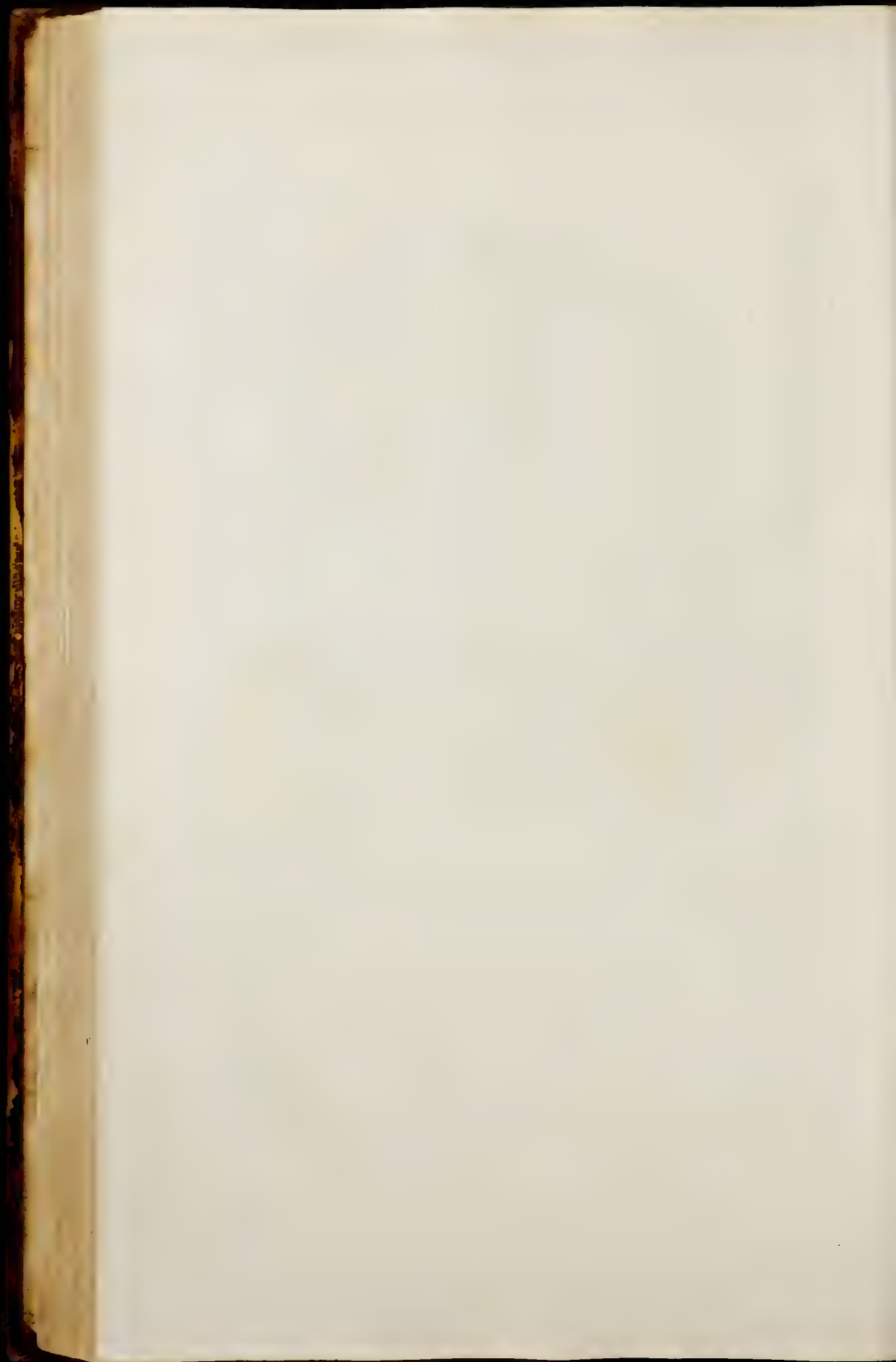


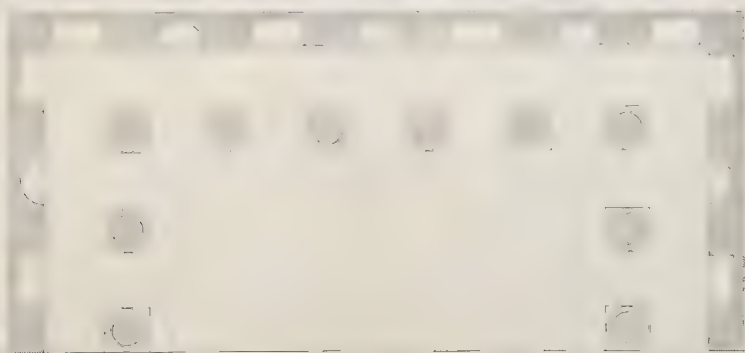


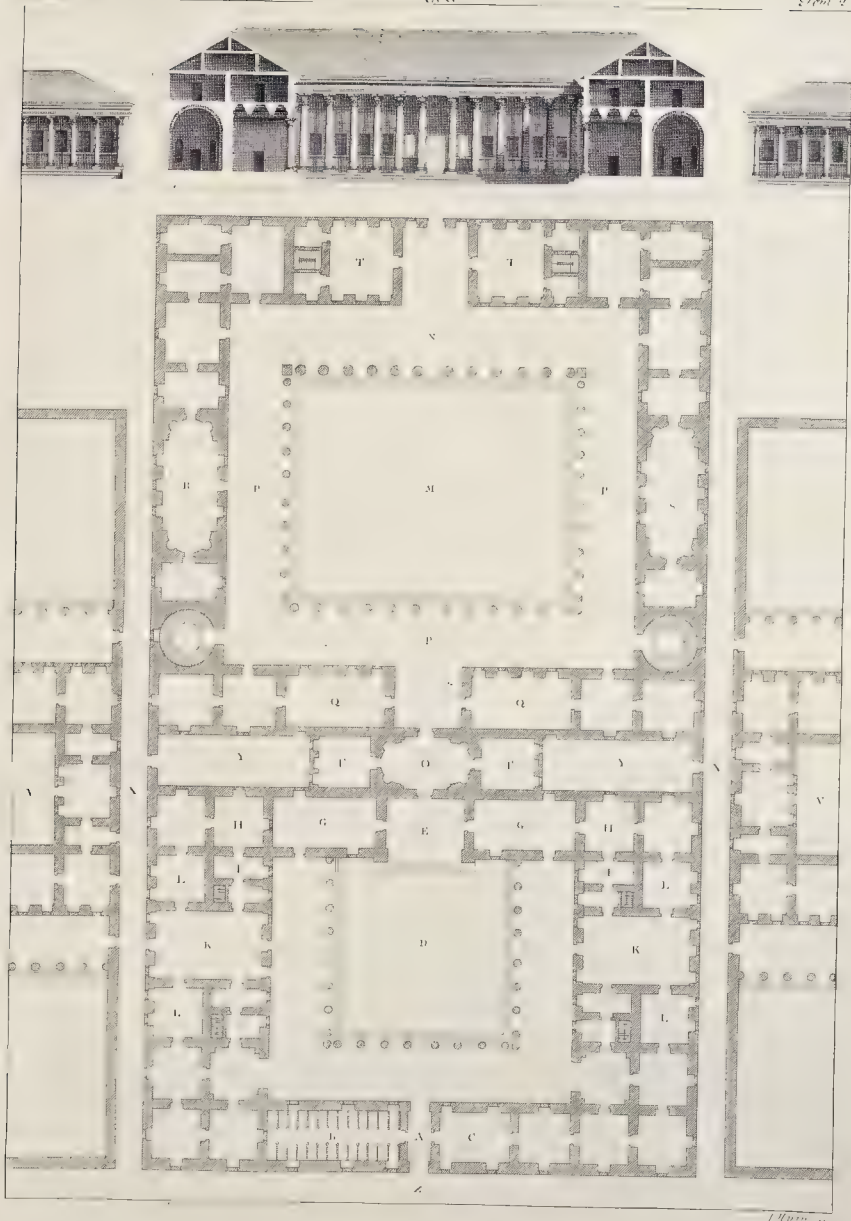




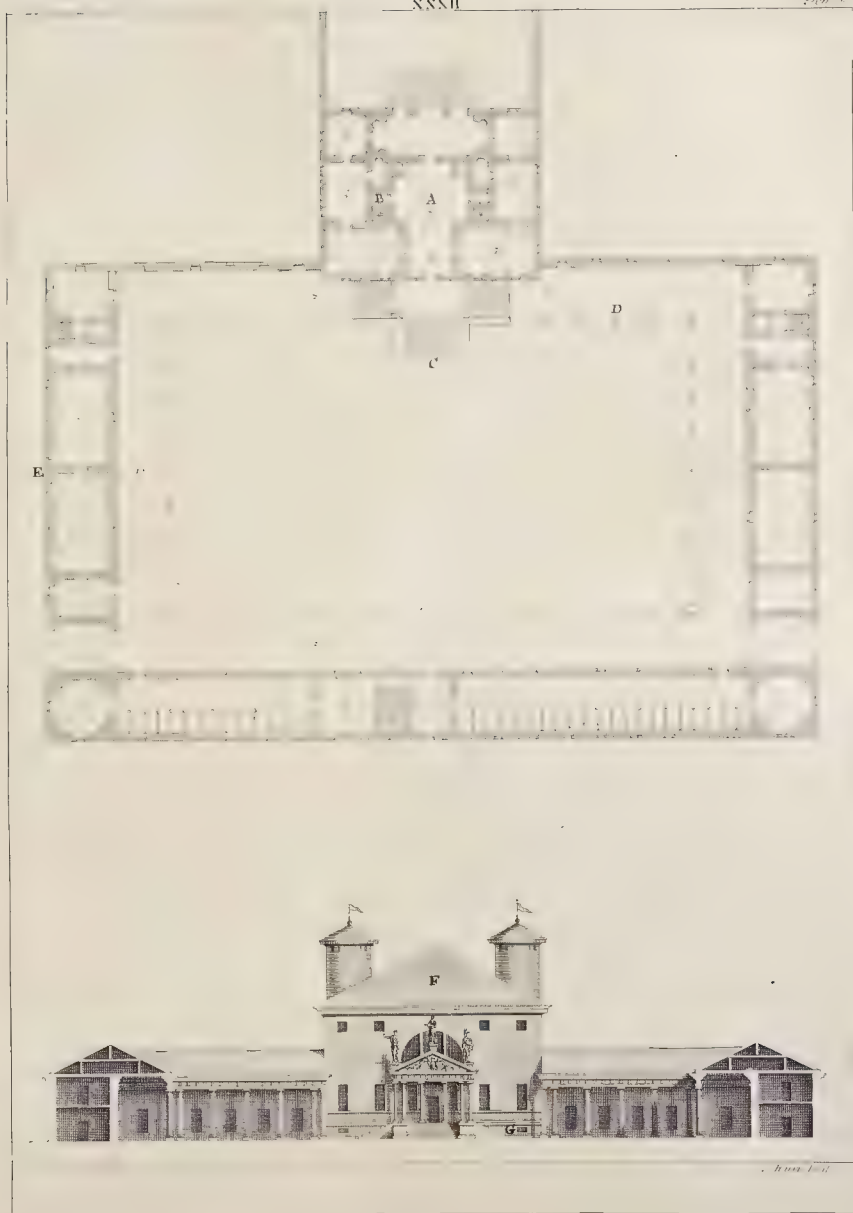


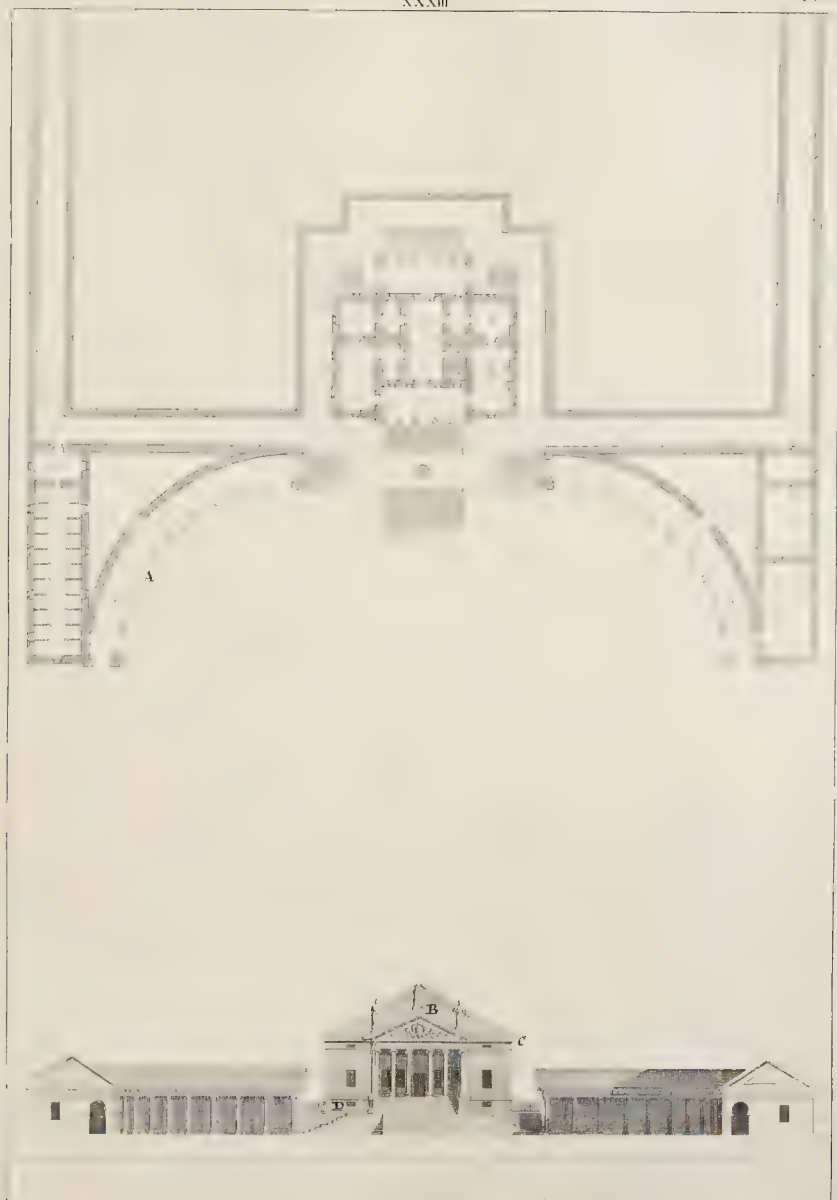


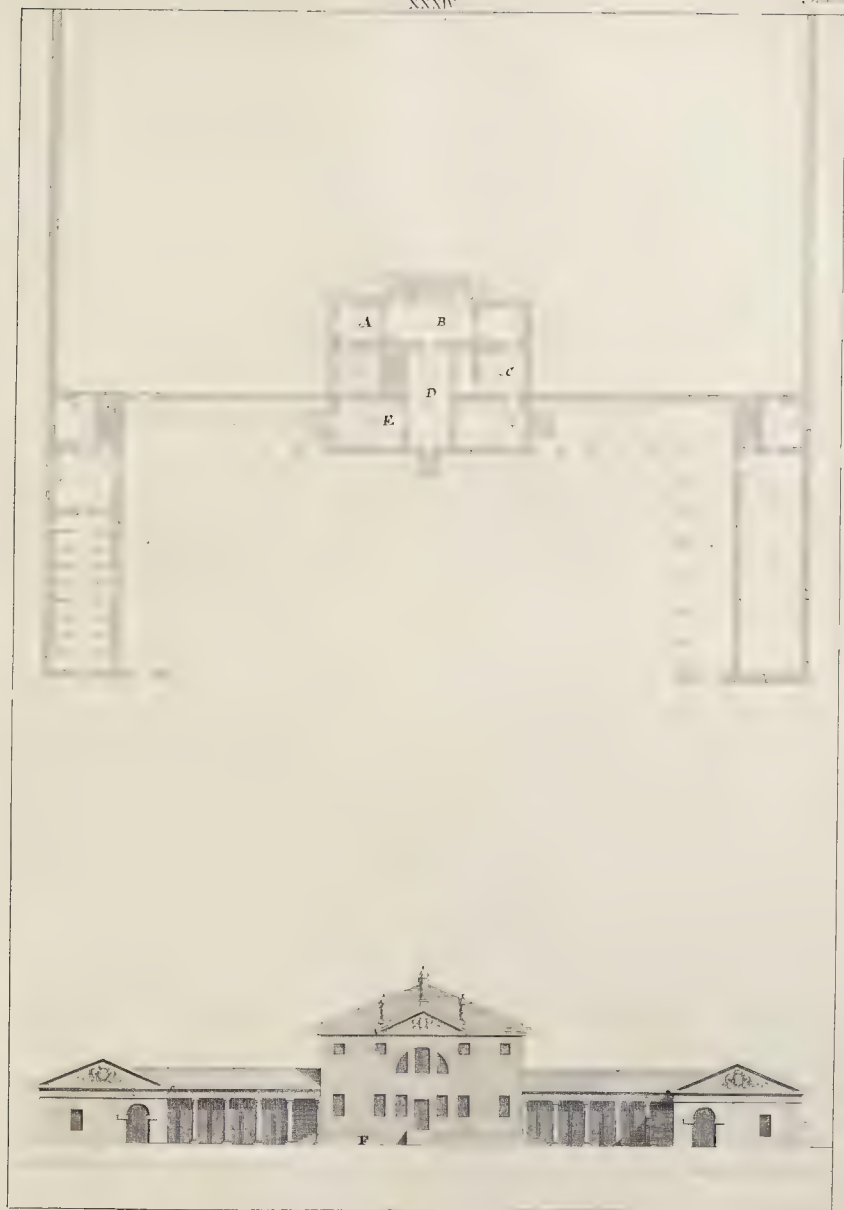


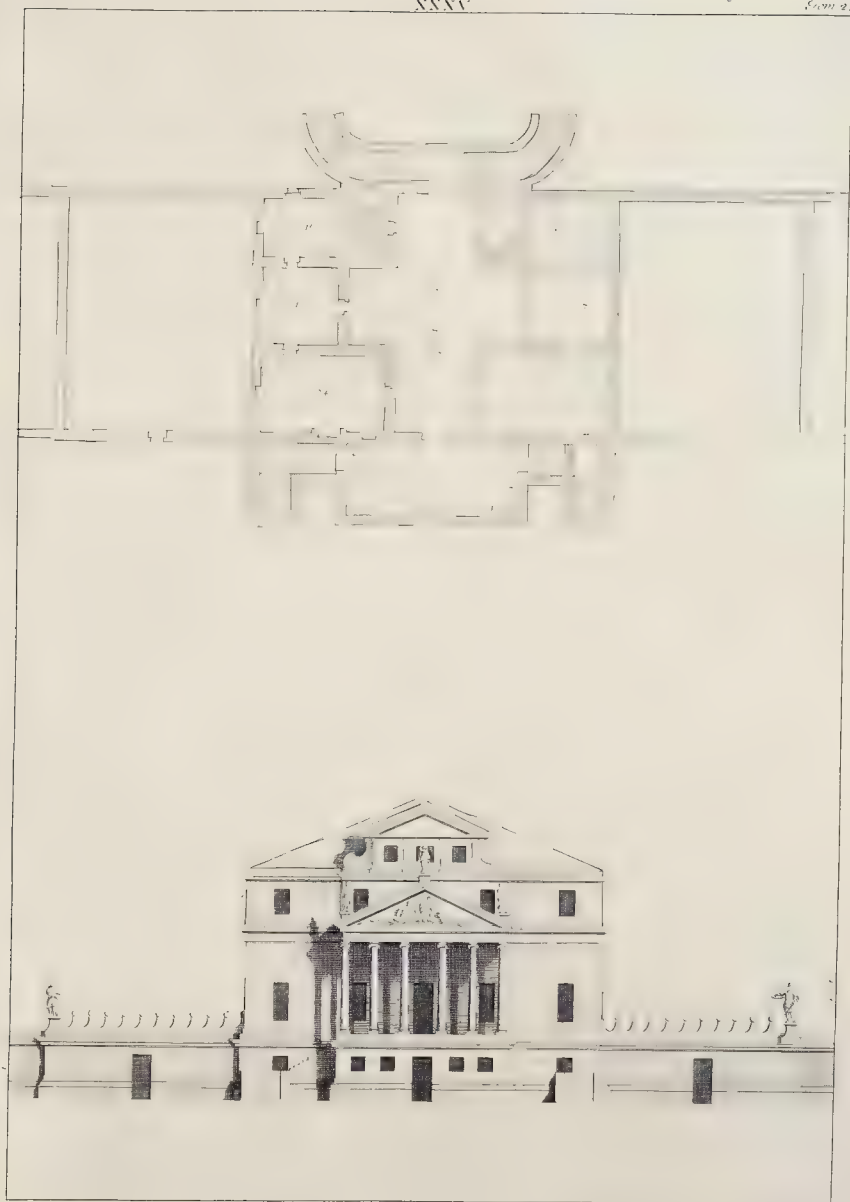


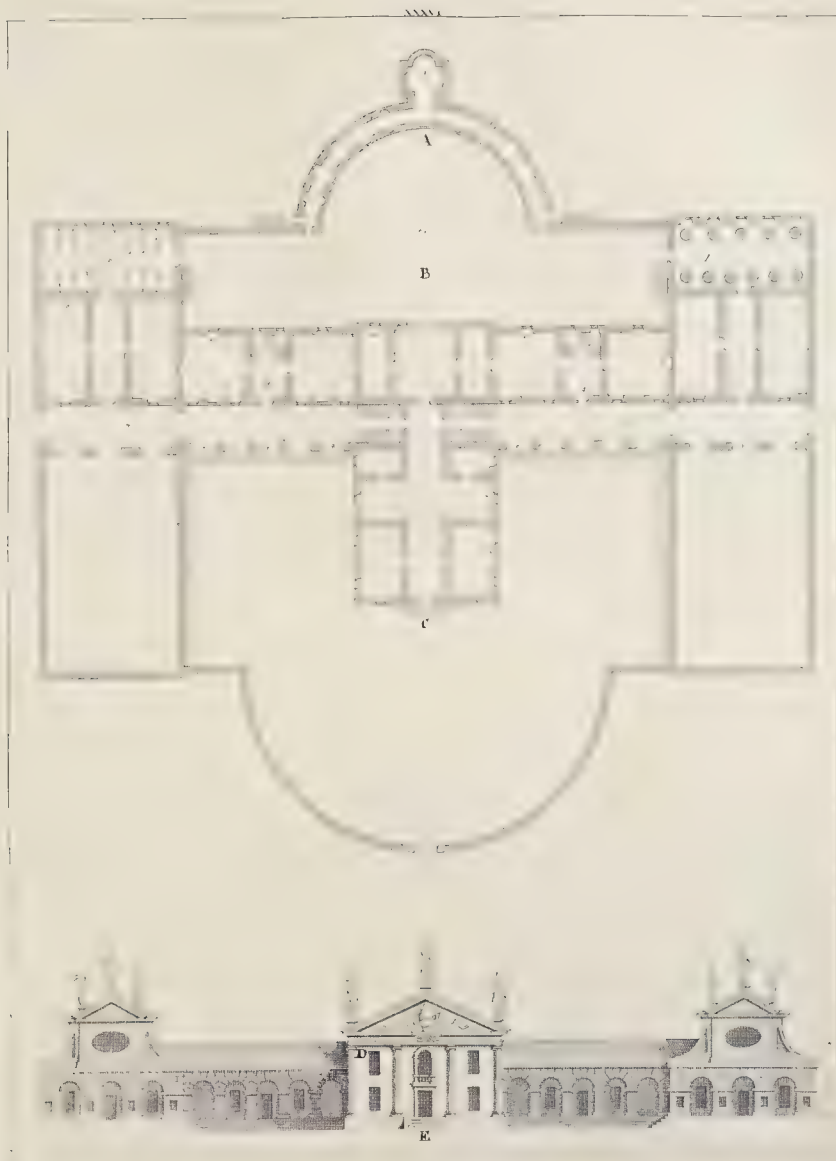




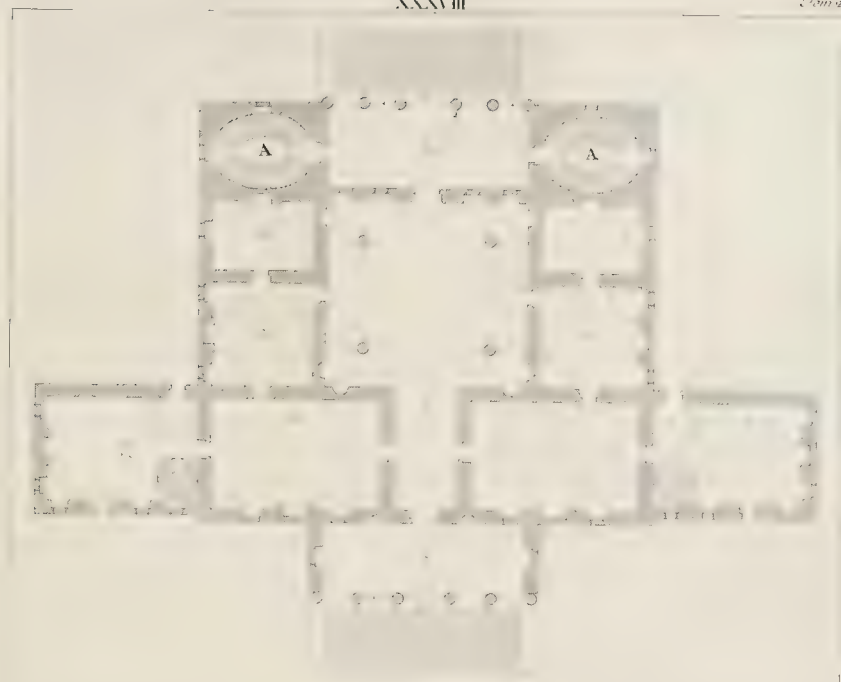


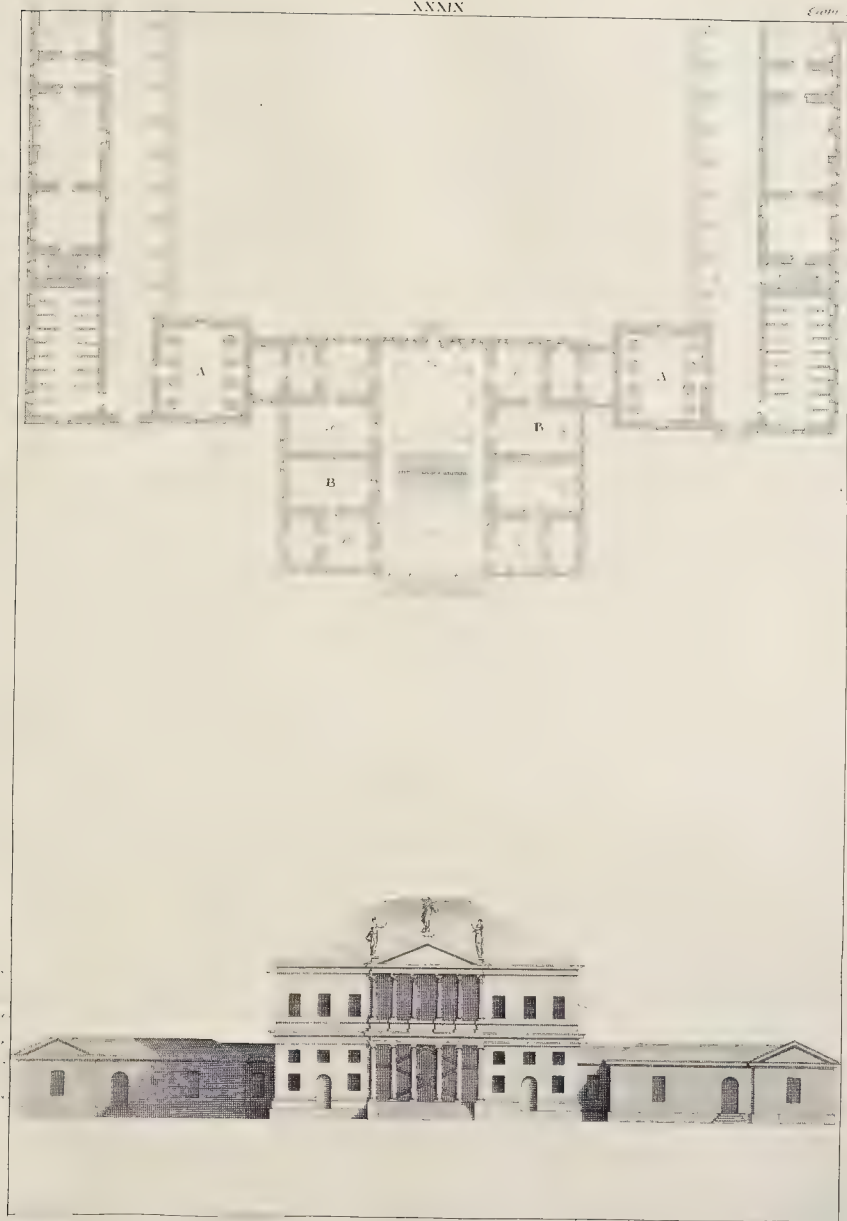


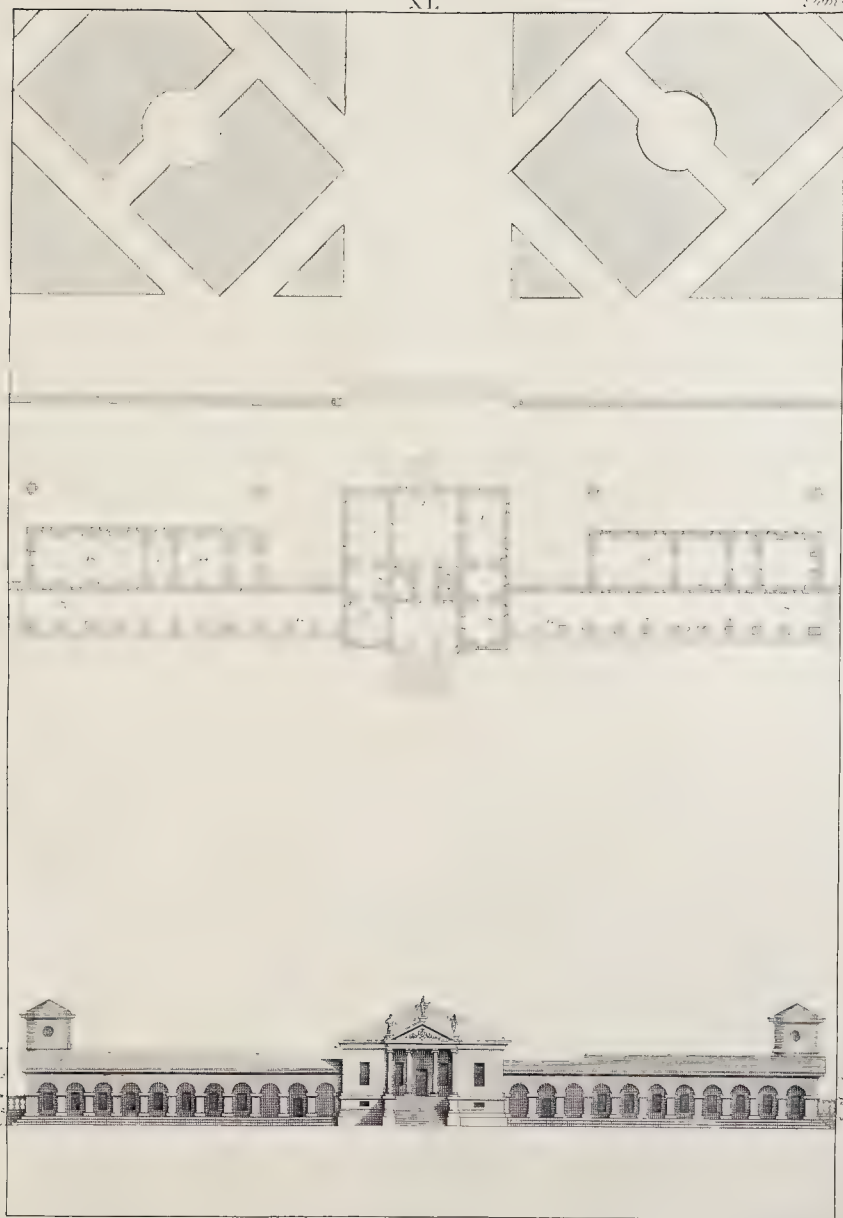


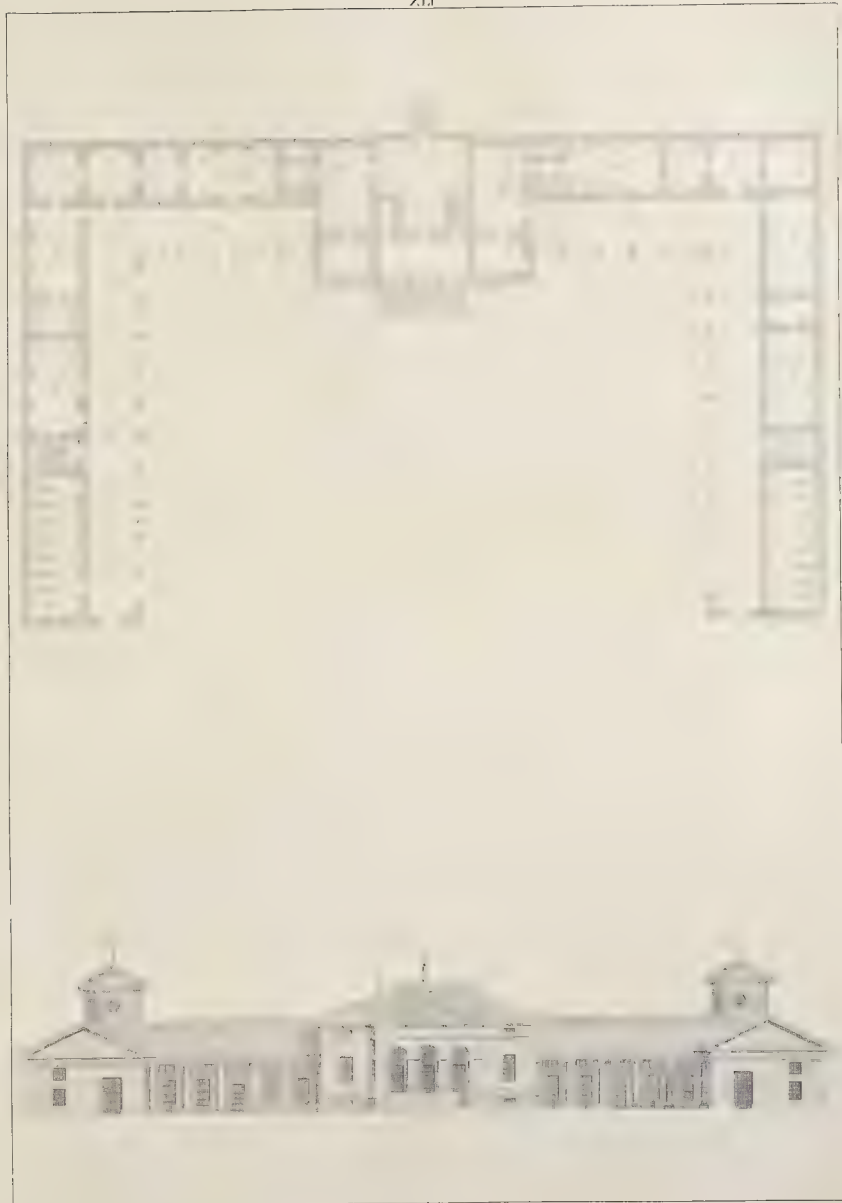






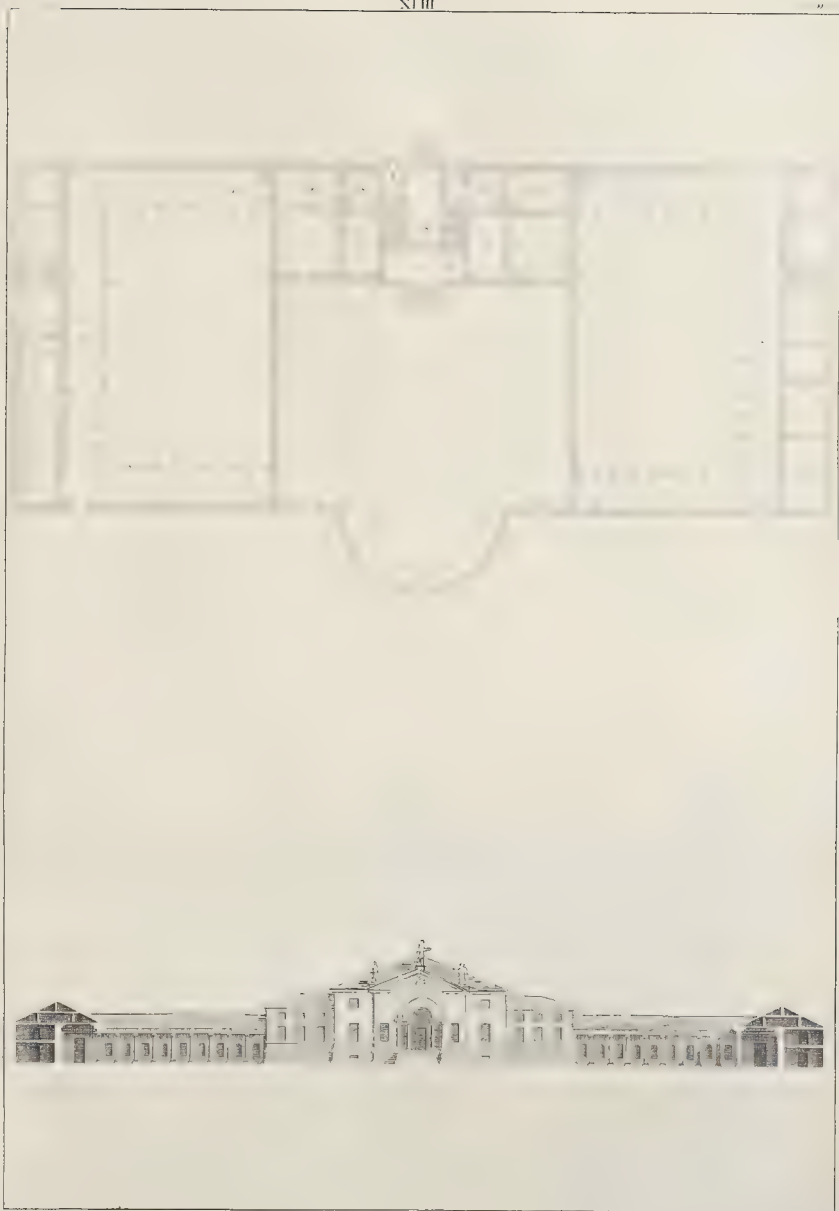


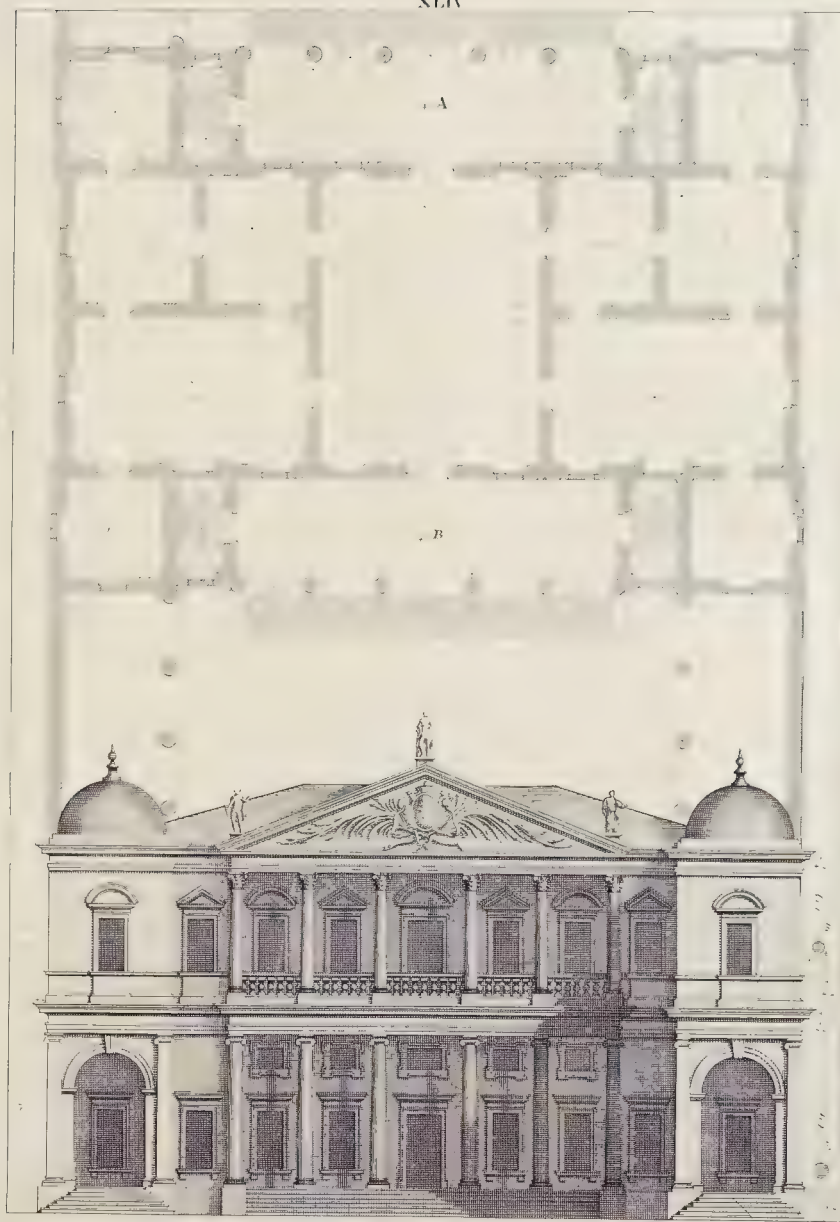


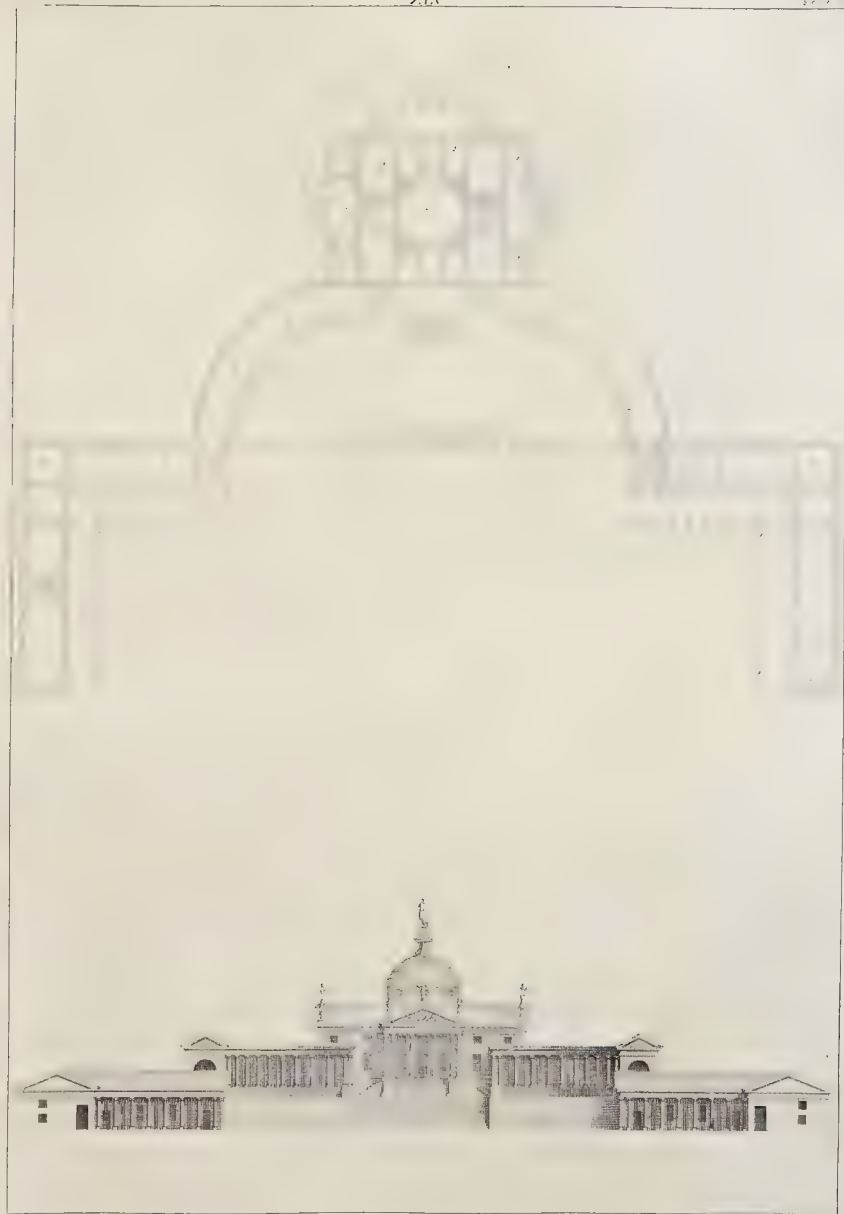


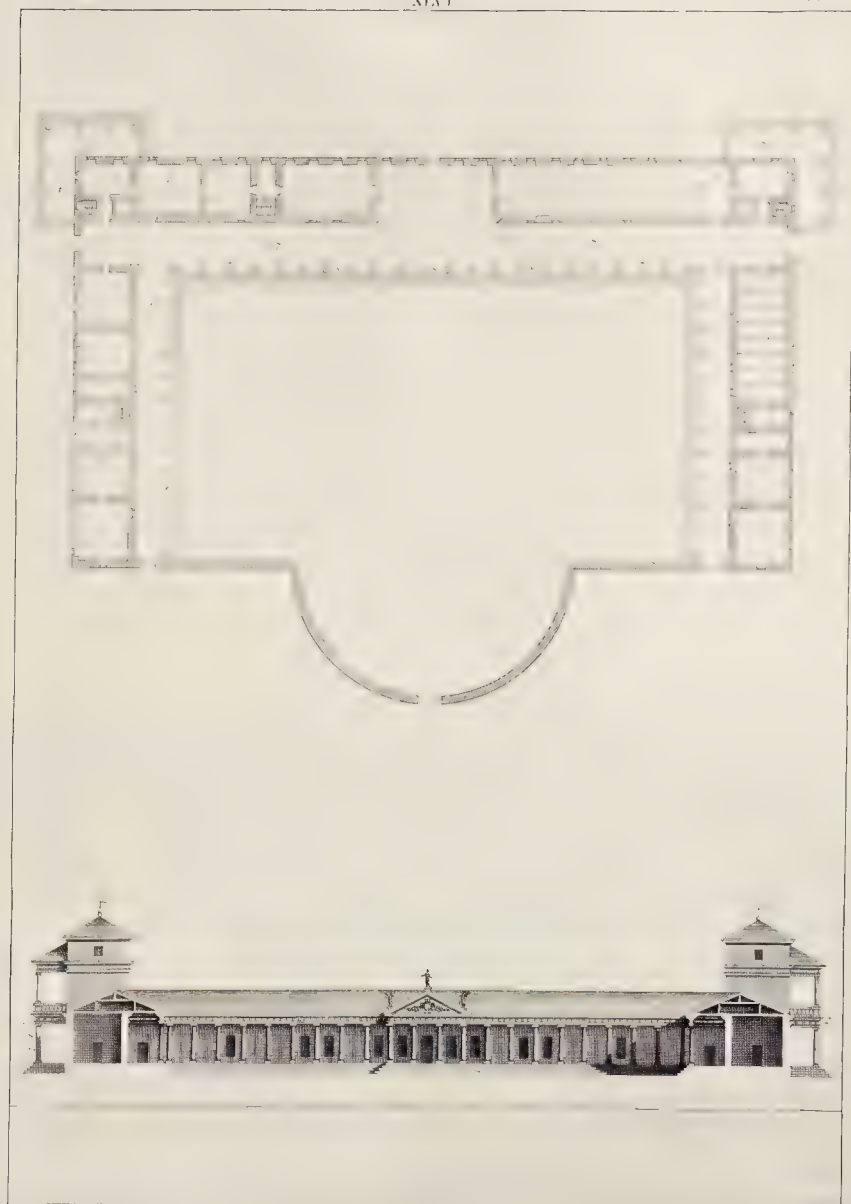


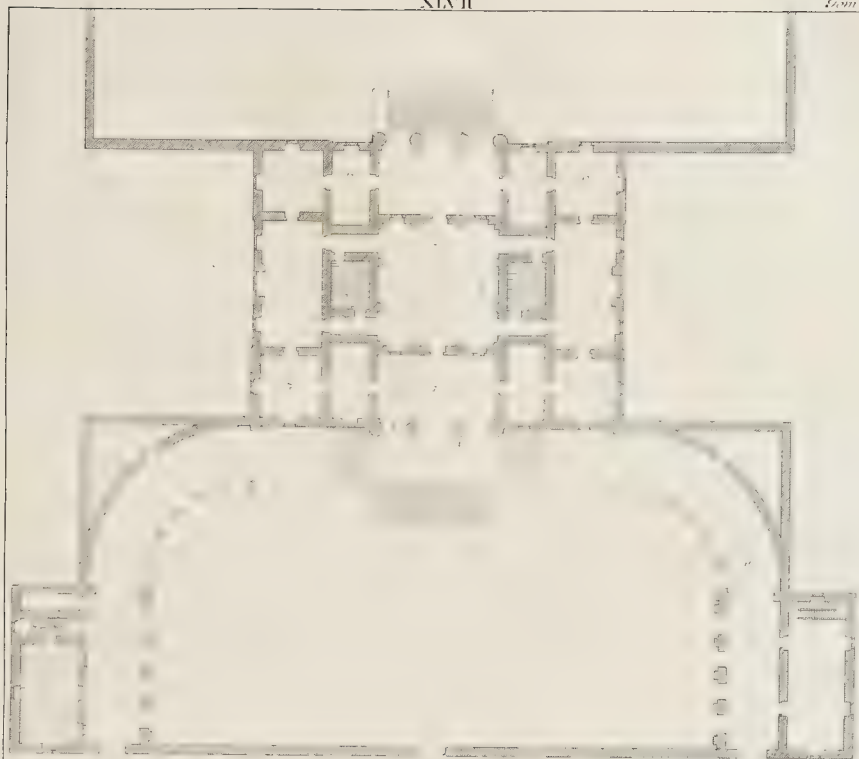
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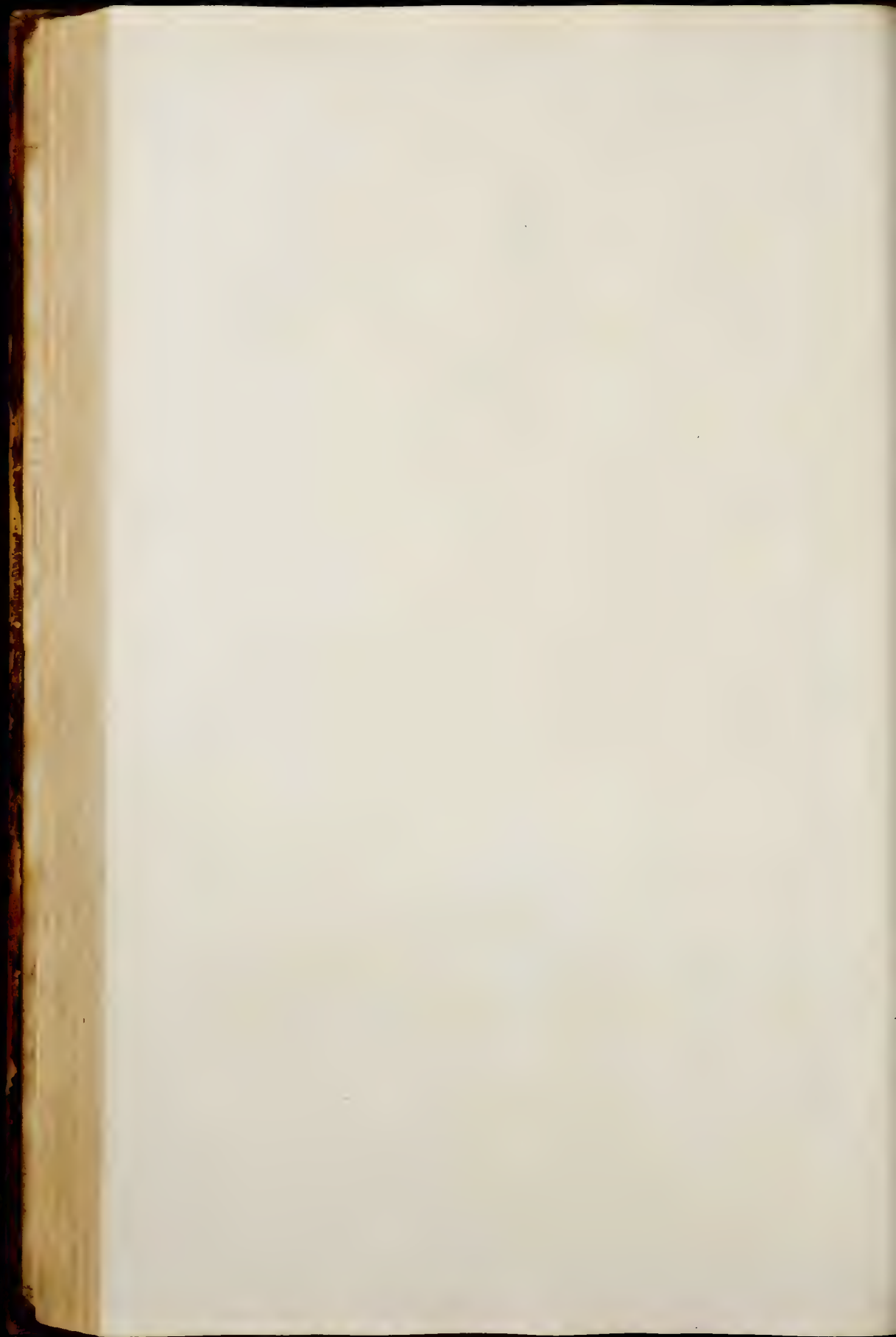






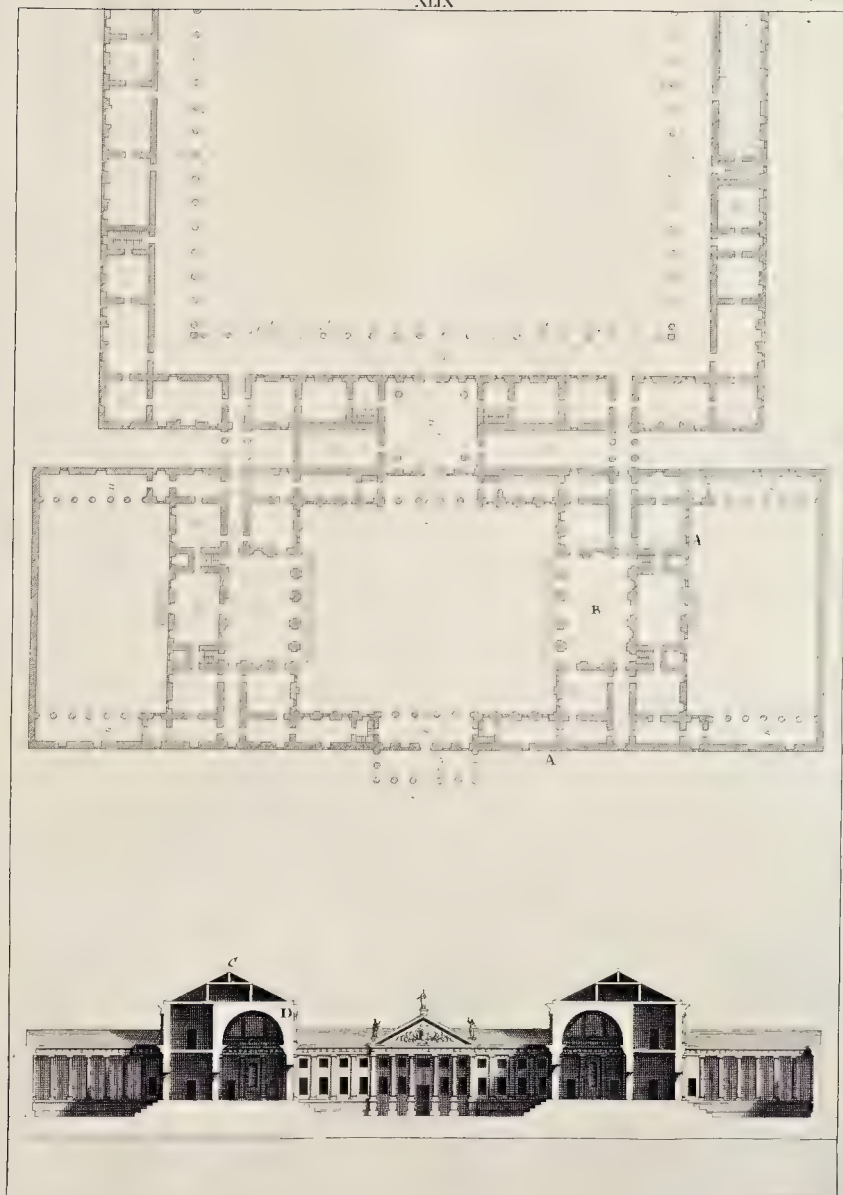


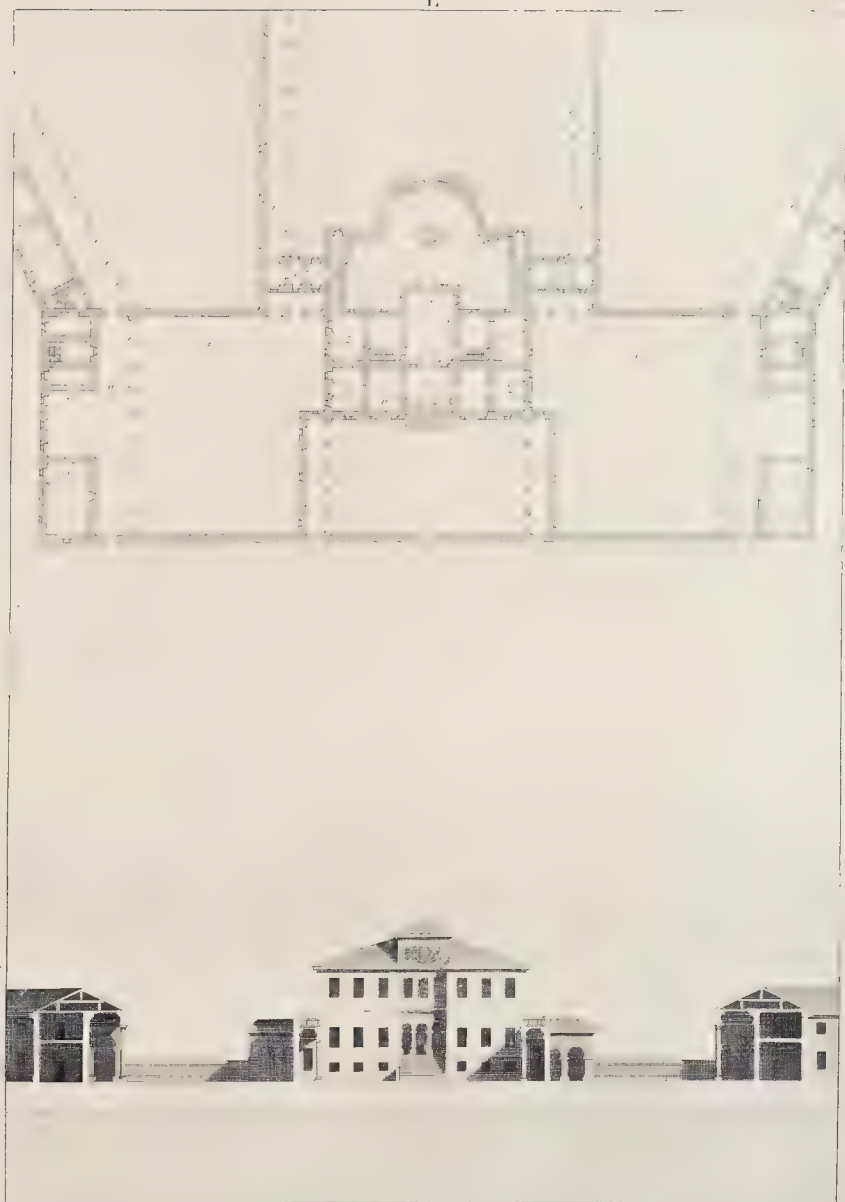


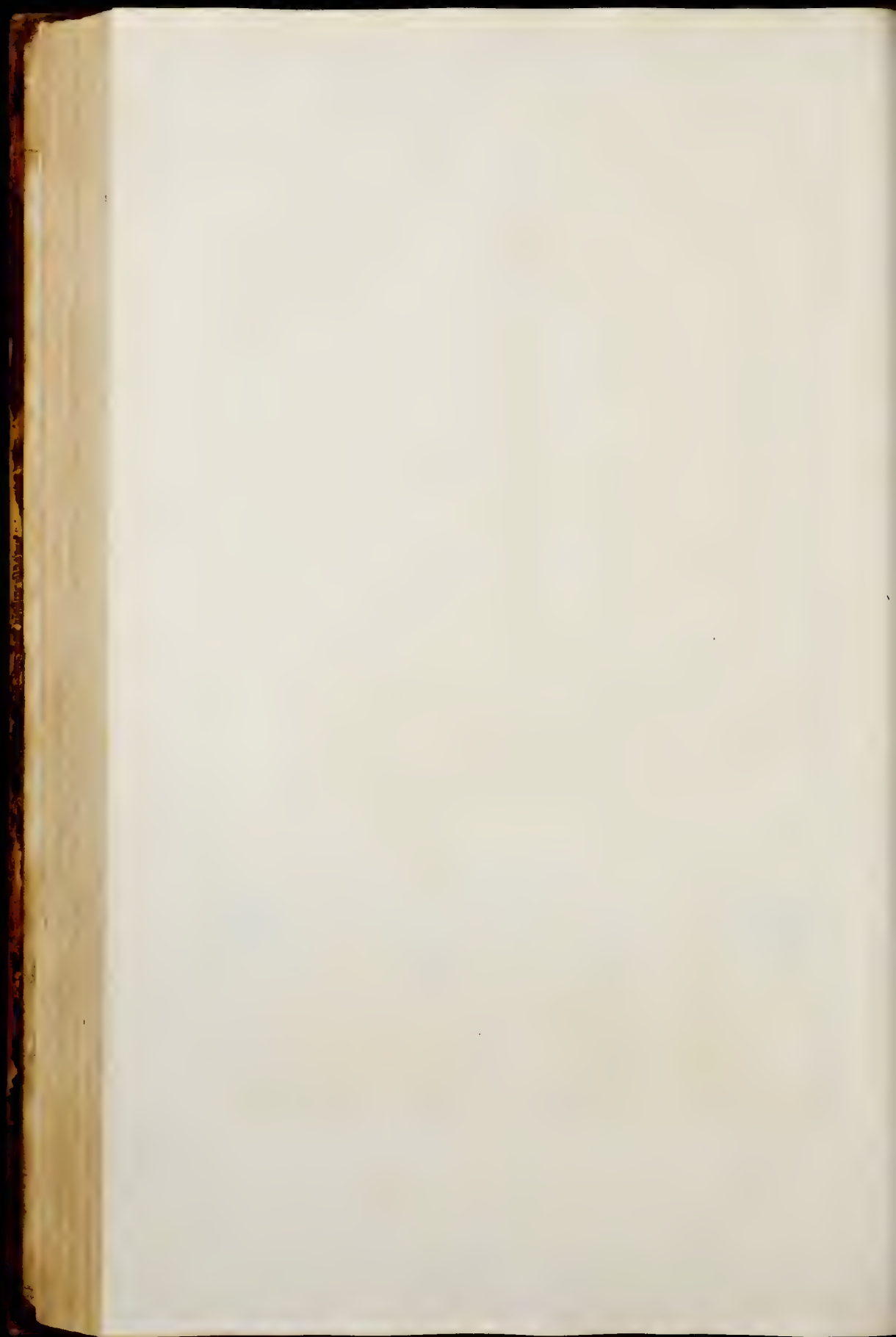


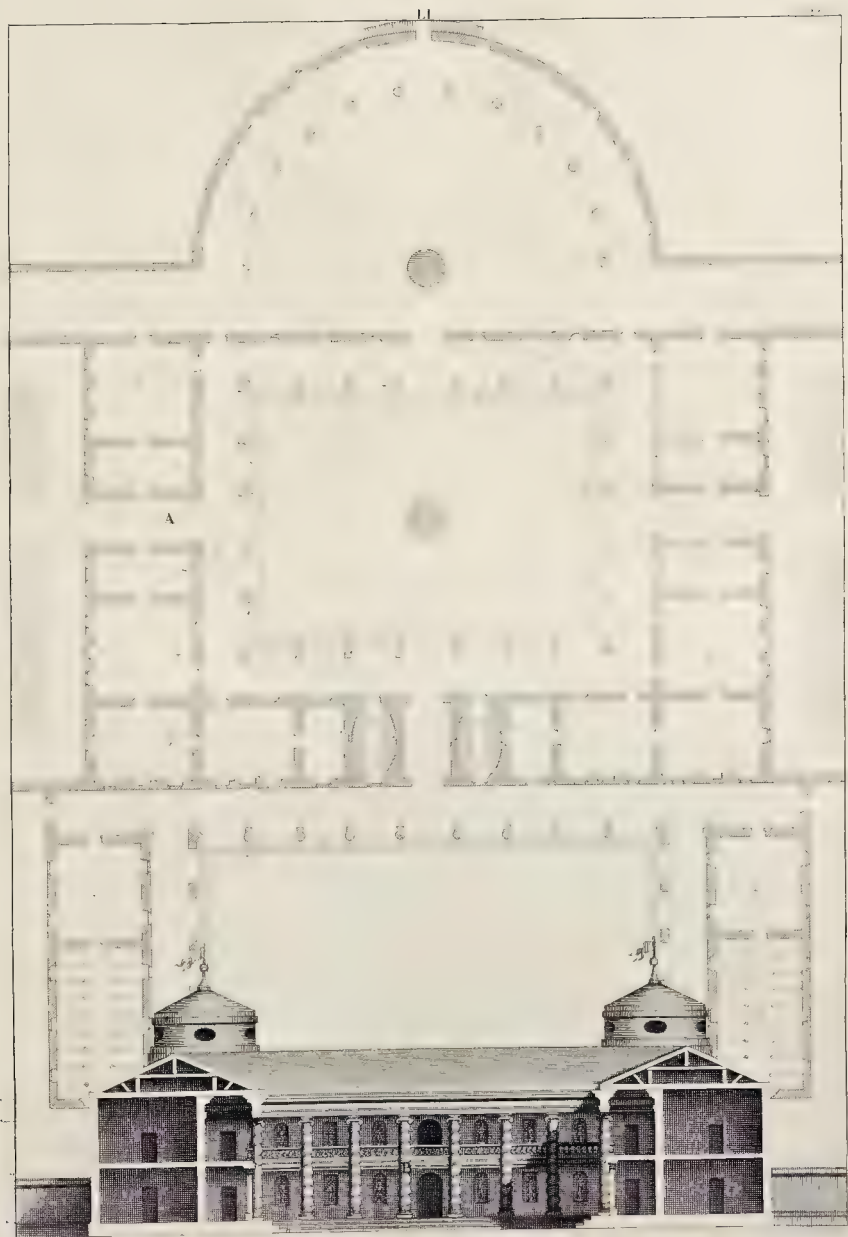


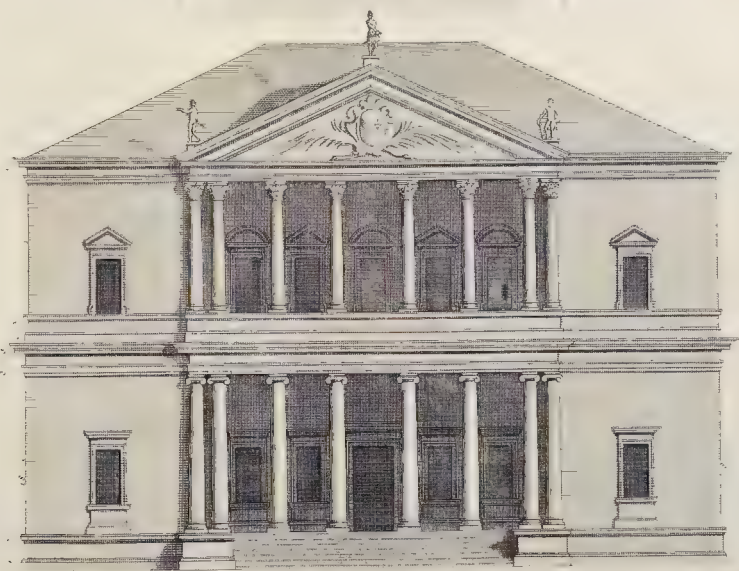
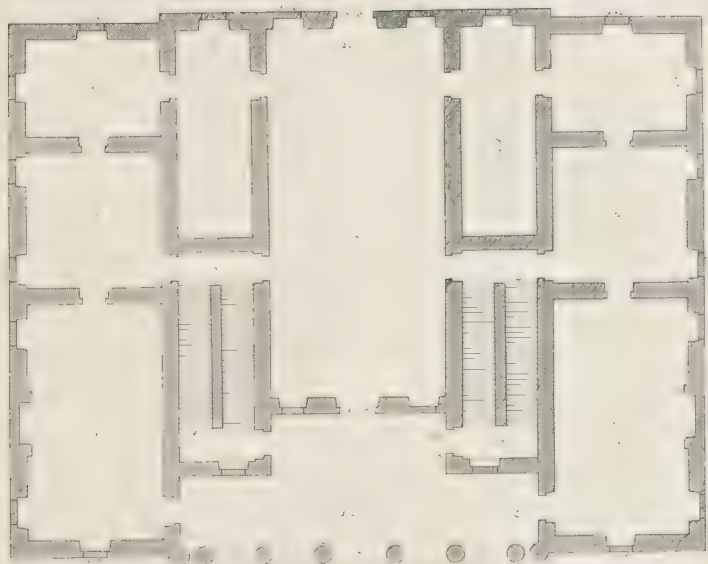


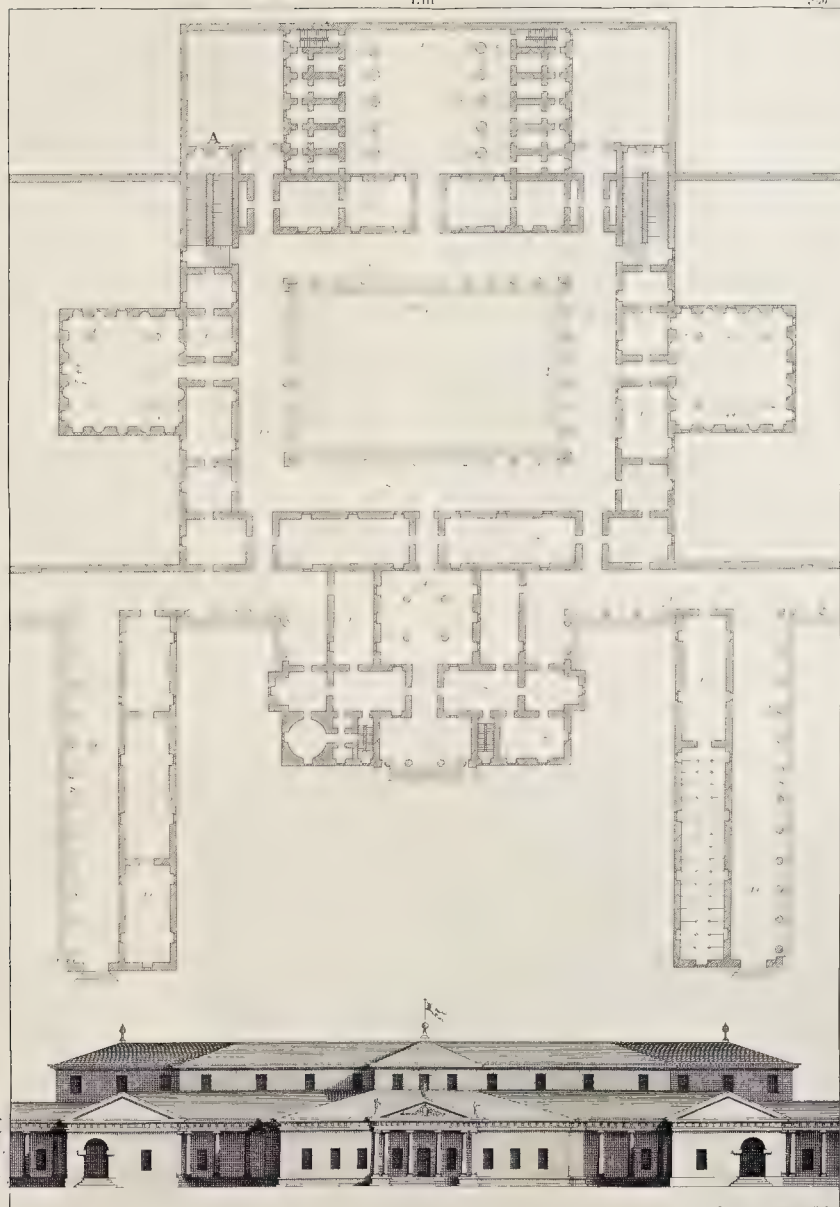




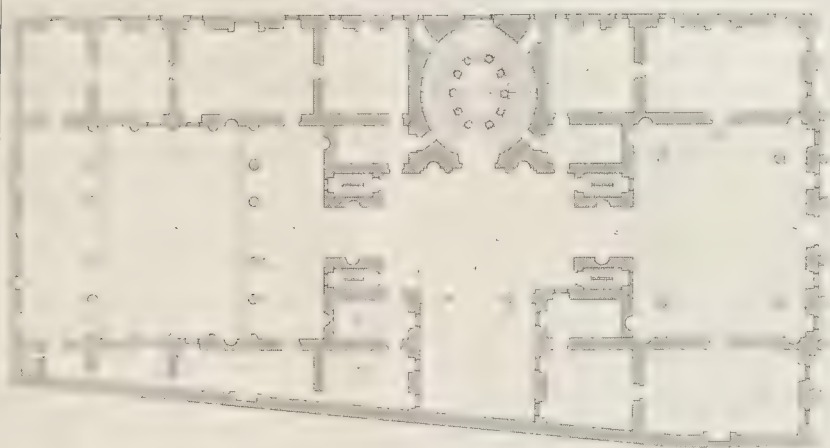


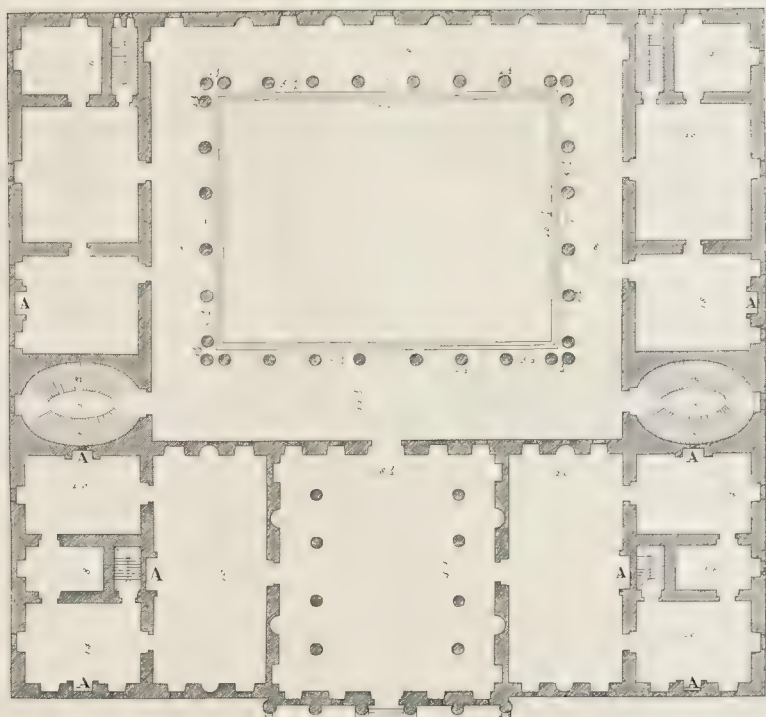


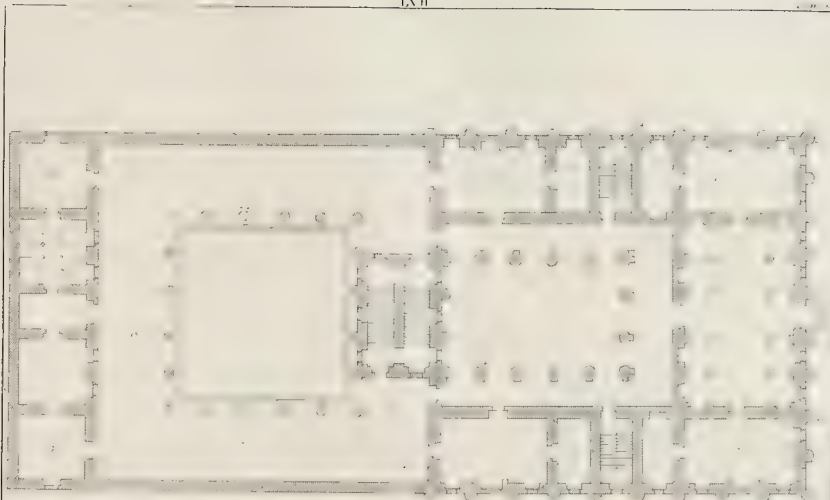


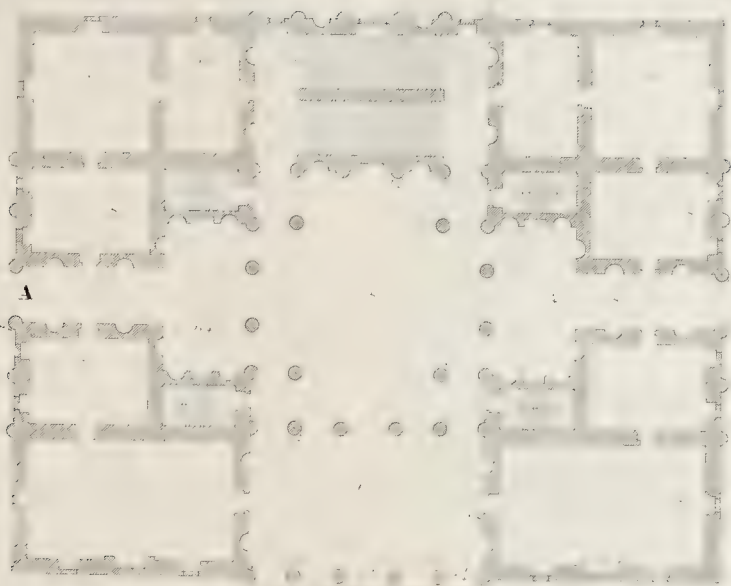


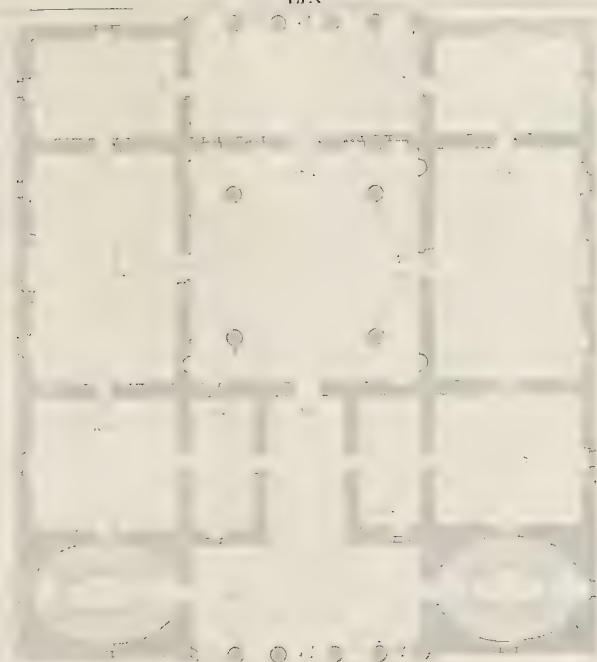


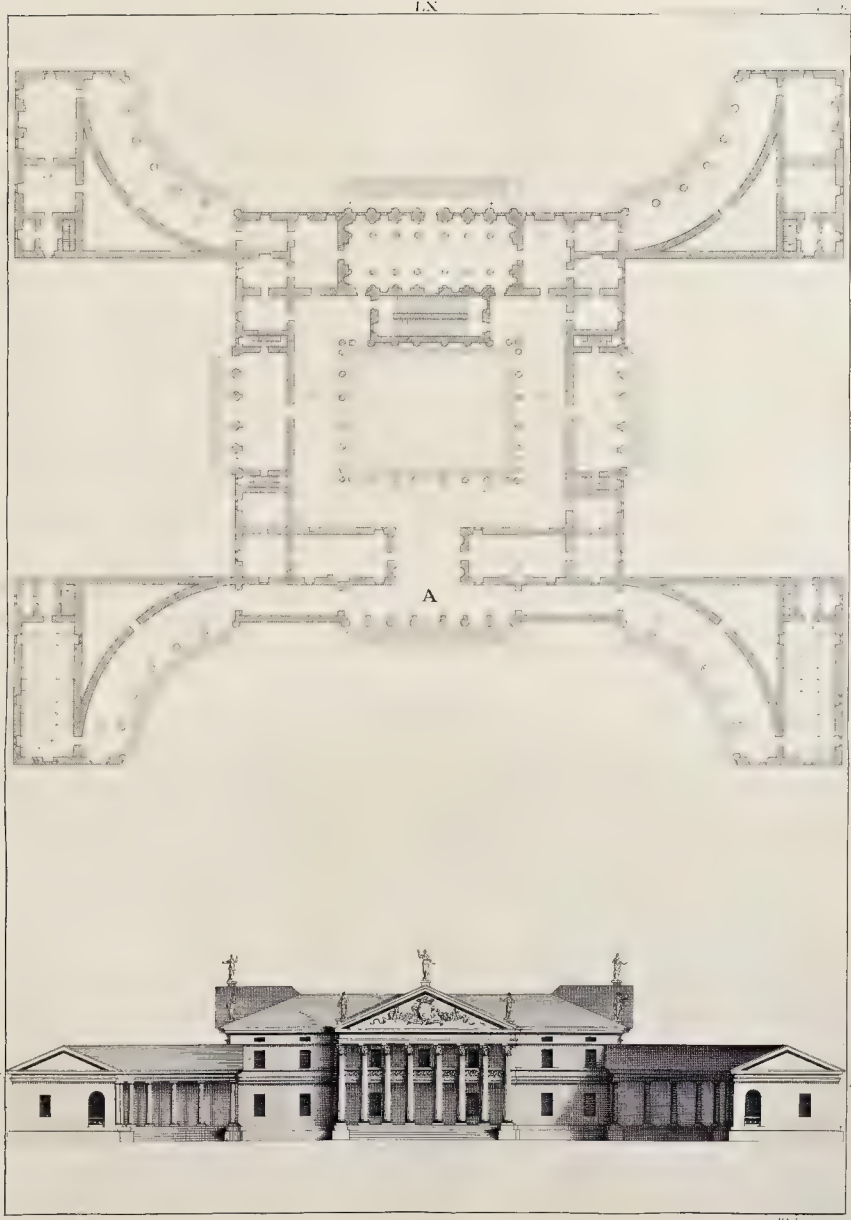


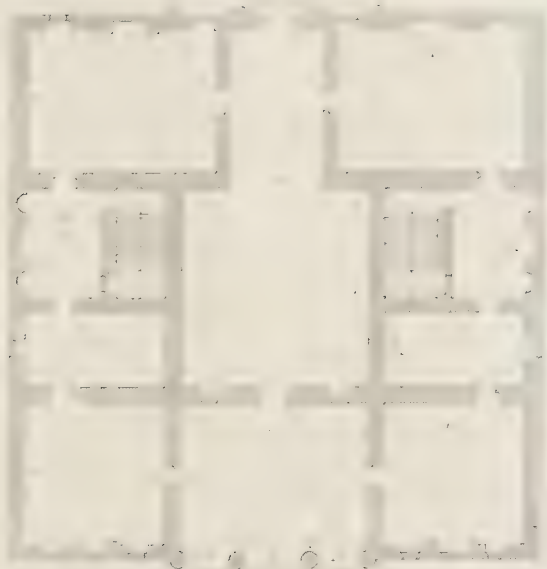












THE
ARCHITECTURE
OF
A. PALLADIO;
BOOK *the* THIRD.

Wherein is Treated of
Ways, Streets, Bridges, Squares, Basilicas or Courts
of Justice, Xiftes or Places of Exercife, &c.

The Whole Revis'd, Design'd, and Publish'd
By GIACOMO LEONI, a Venetian, *Architeēt to His Most*
SERENE HIGHNESS, *the Late*

ELECTOR PALATINE.

Translated from the ITALIAN Original.

With NOTES, by INIGO JONES.



M. DCC. XLII.

THE

NEW

EDITION

THE
P R E F A C E
TO THE
R E A D E R.

HAVING treated as fully as may be of private Buildings, (or the Houses and other conveniencies belonging to particular Persons) and having mention'd all the most necessary directions that ought to be observ'd about the same; having over and above this, given the designs of several of those Houses that have been built by my self, whether within or without the City, and also of those made by the Ancients, according as *Vitruvius* has them: 'tis highly convenient, that turning my Discourse to more excellent and magnificent Fabricks, I should now proceed to treat of publick Edifices; wherein (because they consist of larger dimensions, and that they are beautify'd with more curious Ornaments than private ones, as serving for the use and conveniency of every body) Princes have a most ample field to shew the World the greatness of their Souls, and Architects are furnish'd with the fairest opportunity, to demonstrate their own Abilities in excellent and surprizing inventions. Wherefore, as well in this Book, in which I begin my *Antiquities*, as in those others, which (God willing) are to follow, it is my desire, that by so much the greater application may be used in considering the little I shall say, and the designs I shall give; by how much greater fatigue and longer watchings I have been reducing those Fragments that remain of ancient Buildings into such a form, that I hope the lovers of Antiquity may reap pleasure from the same, and the studious of Architecture receive much benefit: especially seeing that much more is learnt in a little time from good Examples, or Originals by measuring of them, and by seeing entire Edifices with all their parts describ'd on a little piece

piece of Paper; than can in a long time be learnt from words, by which the Reader becomes able only in Idea, and not without some difficulty, to attain to a firm and certain knowledge of what he reads, and to bring it afterwards into practice with great fatigue. Every Person who is not altogether depriv'd of Judgment, may very manifestly perceive, how excellent the manner was, which the Ancients us'd in their Buildings; seeing that after so long a space of time, after so many destructions and mutations of Empires, there still remain in *Italy*, and out of it, the vestiges or ruins of so great a number of their stately Edifices, by the means whereof we come to a certain knowledge of the *Roman* virtue and greatness, which otherwise perhaps had not been believ'd. In this third Book therefore I shall observe the following method, in placing the designs that are contain'd in the same. I shall first give those of Streets, High-ways, and Bridges, as being that part of Architecture which appertains to the Ornament of Cities and Provinces, and which serves for the general conveniency of all sorts of Men. For, as in the other Fabricks made by the Ancients, it's easily discover'd that they spared no expence or labour, to bring them to that height of excellency, allow'd them, even by our imperfection: so they took no small care in the ordering of their Ways, finishing them in such a manner, that thereby, at this very time, may be learnt their greatness and magnanimity; since, to render them commodious and short, they pierc'd Mountains, drain'd Bogs, and built Bridges, thus making those Passages easy and plain, which were interrupted by uneven Vallies, or rapid Rivers. Next I shall treat of *Forums*, or publick places (according as *Vitruvius* teaches us that the *Greeks* and *Romans* made them) and likewise of those Buildings which ought to be erected about such squares: and since among these, that place is worthy of much consideration, where the Judges administer Justice, call'd by the Ancients a *Basilica*, I shall give the particular designs of the same. But since it is not sufficient that Countries and Cities be ever so well divided into their several districts, and regulated by most wholesome Laws; nor that we have Magistrates, who, as Executors of the Laws, keep the Citizens in obedience: if Men be not also render'd wise by the help of Learning, and strong as well as healthy by the Exercise of their Bodies (so to become capable both to govern others and themselves, and to make good defence against those that would oppress them) this is the principal reason, why the Inhabitants of any Country, being divided at first into many little Can-

tons, did afterwards unite and founded Cities. And for this reason also (as *Vitruvius* relates) the ancient *Grecians* erected certain Buildings in their Cities, which they call'd *Pelestras*, and *Xystes*, wherein the Philosophers came to dispute and discourse about the Sciences, and the Youth exercis'd themselves every day : as at certain set times the whole People came there together, to see the *Athletes* (or Fencers and Wrestlers) play their prizes ; I shall therefore give the designs of these Edifices, and so an end will be put to this third Book, which shall be follow'd by that of *Temples* for the exercise of Religion, without which no civil policy can be possibly maintain'd.



THIRD BOOK.

C H A P. I.

Of Ways and Streets.

THE Ways ought to be short, convenient, secure, pleasant and beautiful. They will be short and convenient, if made in a strait line; and so large, that Carriages and Horses be no hindrance to each other when they meet: wherefore it was provided by law among the Ancients, that where the Ways were strait, they should not be less than eight foot in breadth; nor less than sixteen, when they were crooked or winding. The Ways will be further convenient, if they are made every where equal; that is to say, that there be no places in them where Armies may not easily march, and that there be no difficulty of passage, either from Waters, or Rivers: whence we read, that the Emperor *Trajan*, having regard to these two conditions (which are necessarily requir'd in all Ways) when he repair'd the most celebrated *Appian* Way, which in many places was impair'd by time, he drain'd marshy places, levell'd Mountains, fill'd up Valleys, and making Bridges where it was necessary, he render'd travelling upon this Road easy and expeditious. The Ways will be secure, if made on elevated places; or if in the plain, there be, as was the manner of the Ancients, a Ditch and Banks on each side: and that there be no places too near, where Robbers or Enemies may conveniently hide themselves; so that Strangers and Armies may in such ways preserve themselves from surprize, and readily discover any ambush that might be laid for them. Such Ways then, as have the three qualifications aforesaid, must be necessarily fine, and very agreeable to Passengers; by reason that, in the Country, their strait direction, the conveniencies they bring, with the various and distant prospects they afford, must needs alleviate a great part of the fatigue, and fill the mind with satisfaction and delight, presenting always new Landshapes to the Eye. In the City there cannot be a more agreeable sight, than a strait, even, and large Street, having magnificent Houses on each side, and built with those Ornaments, which are mention'd in the preceding Books. Now, as in Towns, the Streets are beautify'd by Buildings; so in the Country are the Ways adorn'd by Trees, which, being planted on both sides, delight our Minds by their verdure, and highly refresh us with their shade. Of such sorts of Ways out of the City, there are many in the *Vicentine*: and among the rest those are famous which are at *Cicogna*, the *Villa* of Count *Edward Thiene*, and at *Quinto*, the *Villa* of Count *Ottavio* of the same Family; which having been directed by me, were afterwards beautify'd and adorn'd by the diligence and industry of the said Gentlemen. The Ways made in this manner afford numberless Conveniencies, because that by reason of their being strait, and somewhat higher than the rest of the ground (always speaking of those in the Country) the Enemy may be discover'd afar off, as I said before, in time of War, whereby a Commander is at liberty to take

take the resolution he thinks most fitting: besides that at other times great profit arises from their shortness and easiness, by reason of the Business and Traffick that is carry'd on by them. But because all Ways are either within or without the City, I shall first particularize the qualifications requisite in those within the City, and next how those should be made that are without. Yet seeing that military Ways are one thing, and non-military another, the first being such as pass through the midst of the City, that lead from one City to another, that serve for the common use of all Passengers, for Carriages to drive, or Armies to march; and the second being such as issue out of the other, or are made for the use and convenience of some particular *Villa*: I shall in the following Chapters treat of the military Ways only, quite omitting the non-military, because these ought to be regulated according to those; and that the more like to them they are, the more commendable they will be.

C H A P. II.

Of the Compartment of the Ways (or Streets) within the City.

IN the compartment, or distribution of the ways in a City, or Town, regard must be ever had to the temperament of the Air, and also to the region of Heaven, or the climate under which the place is situated: because where the Air is cold or temperate, there the Streets ought to be made large and noble, since thereby the City will become more wholesome, convenient, and beautiful: it being certain, that by how much less piercing, and withal by how much freer the Air is, by so much the less will it offend the head; and therefore by how much more a Town is situated in a cold place. or in a piercing Air, and that the Houses are high, by so much the larger ought the Streets to be made, that they may be visited by the Sun in every part of them. As for what concerns convenience, since there is more room in large than in narrow Streets, for Men, Cattle, and Carriages, there is no doubt but those are much more convenient than these: and it being likewise manifest, that broad Streets are more lightsome, and that therefore the one side of such a Street is less eclips'd by the opposite side, the beautyfulness of Temples and Palaces must needs be seen to greater advantage in the large than in the narrow Streets, whence greater pleasure arises in the mind, and greater Ornament accrues to the City. But if the Town is situated in a hot climate, the Streets ought to be made narrow, and the Houses built high; that by the shade and straitness of the passage, the heat of the Air may be temper'd, and consequently that it may become more healthy: as this is well known by the example of *Rome*, which, as we read in *Cornelius Tacitus*, grew more hot and less healthy, after *Nero*, in order to make it more beautiful, had enlarg'd its Streets. In this case however, for the greater ornament and convenience of the City, the Street that is fullest of the principal Trades, and the most frequented by Strangers, ought to be made large, and adorn'd with magnificent and sumptuous Buildings; because the Strangers that pass thro' it will readily conclude, that the other Streets of the City bear a proportion to the largeness and beauty of this. The principal Streets, which we have named *military*, ought to be so comparted, as to be strait, and to lead in a direct line from the Gates to the chief place or square

square of the City; and likewise, if the situation will permit it, sometimes from one Gate directly to the Gate on the opposite side: nor ought it to be forgotten, that according to the compass of the City, there should in the same Street, and on the same line, or in any other such Street, and leading from which of the Gates you please, be made one, or more such squares, somewhat less than the principal one. The other Streets of the City, at least the finest of them, ought not only to lead to the principal Square, or open place; but also to the remarkable Temples, Palaces, Porticos, and other publick Fabricks. But the greatest care must be taken in this compartment of the Streets, that (as *Vitruvius* teaches in the sixth Chapter of his first Book) they do not directly face any of the principal winds, that these may not blow violently or furiously into the same, but that they may come broken, gentle, purified, and spent; lest you fall into the same inconvenience with those, who of old in the Isle of *Lesbos* comparted the Streets of *Metelinum*, from which City the whole Island has taken its name. The Ways, or Streets, of a Town must be always paved; and we read that in the Consulship of *Emilius* they begun to pave the Streets of *Rome*, whereof some are seen at this day, and which are all even, consisting of Stones unequal in their bigness and angles: which sort of paving, how it was performed, we shall teach lower in this Book. But if you would divide the place for the passage of Men, from that for the use of Carriages and Beasts, 'tis my opinion that *Porticos* should be made on each side of the Street, under the cover of which the Citizens may go about their affairs, without being annoy'd by the Sun, the Rain, or the Snow; and in this manner are almost all the Streets of *Padua*, a very ancient City, famous for its University. Or if *Porticos* be not made, in which case the Streets will be more large and pleasant, a border must be paved on each side with broad Stones, or square Tyles, which are a sort of Bricks larger than *Quadrals*, or common ones; and the reason is, that in walking they never offend the feet: so that the middle of the Street will be left for Carriages and Beasts, and may be paved with Flint, or any other hard Stone. There must be a Kennel in the middle of the Street, towards which each side is gently to incline, that the Rain-water which falls off the Houses may run all into one Channel, and have a free and easy course: whence the Streets will be left clean, and no bad Air be produced; as it happens, when such Waters gather into one place, and stagnate or putrify there.

C H A P III.

Of the Ways, or Roads, without the City.

THE Ways without the City ought to be made large, commodious on both sides, and planted with Trees, by whose shade the Passengers are shelter'd from the heat of the Sun in Summer, as their Eyes will be agreeably refresh'd by their verdure. The Ancients laid out great care and labour on such Ways: and therefore, that they might always continue in good repair, they created Prefects, Overseers, or Curators of the same. They made a great many of those Ways, which, altho' spoilt by time, yet still preserve in some places the memory of their beauty and conveniency. But among the most famous are the *Flaminian* and *Appian* Ways. The first was made by the Consul *Flaminius*, after his victory

over

Chap. 3. *Of the Ways, or Roads, without the City.*

over the *Ligurians* (or *Genoese*.) It begun at the Gate *Flamentana* (at this day call'd *Porto del popolo*) and passing thro' *Tuscany* and *Umbria*, it led to *Ariminum*; from which City it was afterwards by *Marcus Lepidus* his Collegue continu'd to *Bononia* (now *Bologna*) and near the foot of the *Alps*, winding round the Marshes, it ended at *Aquileia*. The *Appian Way* took its name from *Appius Claudius*, by whom it was made with great labour and expence; whence, by reason of its magnificence, and the wonderful art that was laid out upon it, it was call'd the *Queen of Roads*. This Way took its beginning from the *Coliseo* (or *Pompey's Amphitheatre*) and leading thro' the *Porta-capena* (a Gate of *Rome* so called) it extended quite to *Brundisium*. It was carry'd only to *Capua* by *Appius*: nor is it certain who was the Author of it beyond, tho' by some it is thought to be *Cæsar*, because *Plutarch* says, that the care of this Way being committed to *Cæsar*, he laid out upon it a great sum of Money. It was last of all repair'd by the Emperor *Trajan*, who, as I said above, by draining of Marshes, levelling of Mountains, filling up of Valleys, and making Bridges where it was necessary, restor'd it to be both expeditious and most agreeable to Passengers. The *Aurelian Way* is likewise highly celebrated, so called from *Aurelius* a Citizen of *Rome*, who made it. It begun at the *Aurelian Gate*, now called the Gate of *St. Pancrace*; and extending it self along the maritime places of *Tuscany*, it ended at *Pisa*. Of no less renown were the *Numentan*, the *Preneftin*, and the *Labican* Ways. The first begun from the Gate *Viminalis*, now call'd the Gate of *St. Agnes*, and extended to the City of *Numentum*: The second begun at the Gate *Esquilina*, now call'd that of *St. Lawrence*; the third from the Gate *Nevia* (which is now the *Porta-maggiore*) and both these ways led to the City of *Prenefte*, call'd at this day *Pellestrino*, and to the famous City of *Labicana*. There were a great many other Ways which are mention'd and celebrated by Authors, as the *Via Salaria*, the *Collatina*, the *Latina*, and others, every one of which took its name either from the Person that made it, or from the Gate where it begun, or from the place where it ended. But for conveniency and beauty they must have been all far surpass'd by the *Portuensian Way*, which reach'd from *Rome* to *Ostia*; because, as *Alberti* affirms to have observ'd, it was divided into two Ways, between each of which there was a course of Stones higher by a foot than the rest of the Way, and which serv'd for a division: so that People went by one of these Ways, and return'd by the other, thus avoiding all hindrance or jostling of each other; and it was indeed a very convenient invention, considering the prodigious concourse of People that was then at *Rome* from all parts of the World. The Ancients made those military Roads after two manner of ways; that is, either by paving them with Stones, or covering them all over with Gravel and Sand. The Ways of the first sort (as far as by some remains of them we have been able to conjecture) were divided into three spaces. On that in the midst, which was higher than the other two, and which was a little rising in the middle, that no Water might stay upon it, but run off immediately, went the People who travell'd on foot. It was pay'd with uncertain Stones, that is, such as had unequal sides and angles; in which kind of paving, as is said elsewhere, they used a square-rule of lead, which they open'd and clos'd according to the figure of the Stones, whence they join'd them perfectly well together, and with great readiness. The other two spaces on each side of this were made a little lower, and were cover'd with Sand and fine Gravel, being destin'd for the passage of Horses and other Cattle. Each of these spaces were half as high as that in the middle,

from which they were divided by a range of Stones pitch'd edge-way ; and at certain distances were other Stones somewhat higher, on which they got up when they would mount on Horseback, the Ancients not having had the Use of Stirrups. Besides the Stones for this purpose, there were other Stones a good deal higher, on which at equal spaces were engrav'd the Miles of the whole Journey ; which Stones were set up, and the Ways measur'd by *Cneus Gracchus*. The military Ways after the second manner, that is to say, made of Sand and Gravel, were rais'd by the Ancients a little in the middle ; for which reason no water being able to remain upon them, and consisting of matter very apt to become quickly dry, they were at all times even and smooth without either dirt or dust. Of this sort one is to be seen in *Friuli*, which by the Inhabitants is call'd the *Posthumous* way, and it leads into *Hungary*. There is another of them in the Country of *Padua*, which taking its beginning from the said City, at the place call'd *Argere*, passes thro' the midst of *Cicogna*, the *Villa* of the Counts *Edward* and *Theodore de Thiene*, Brothers, and leads to those *Alps* which divide *Italy* from *Germany*. The following draught* is of the first manner of Ways, by which may be understood how the *Ostian Way* was made : but I have not thought it necessary to make any design of the second manner of Ways, because it is a most easy matter in it self ; neither is there any difficulty to make them swelling towards the middle, in order to make the Waters run off.

- A. The middle space for the passage of People on foot.
- C. The Ways on each side for the passage of Carriages and Cattle.
- B. The Stones by the help of which People got on Horseback.
- D. The military Stones, to mark the distances to and from Rome.
- E. A section of the three Ways, shewing their different levels.

C H A P. IV.

Of such things as are to be observ'd in building of Bridges, and what situation ought to be chosen for this purpose.

THE convenience of Bridges was first thought upon, because many Rivers are not fordable by reason of their largeness, depth, and rapidity : upon which account it may be well said, that Bridges are a principal part of the way ; and are nothing else, but a Street, or Way continu'd over the Water. Bridges therefore ought to have the self-same qualifications, that we judg'd requisite in all other Fabricks : which are, that they should be convenient, beautiful, and durable. They will be convenient, when they are not rais'd above the level of the rest of the Way, or that being rais'd, they be of easy ascent and descent ; and likewise when such a place is chosen for Building them, as shall be most commodious for the whole Province or the whole City, according as they are built within or without the Walls : and therefore that place is to be chosen, to which there is an easy passage from all other parts ; I mean that it be towards the midst of the Province or the City (as *Nicotris* Queen of *Babylon* did in the Bridge which she built over the *Euphrates*) and not in a corner, where it can be only serviceable to a few. Bridges will be fine and durable, if they are made in the manner, and

according to the proportions which shall be particulariz'd in this Book: but in chusing a situation for building them, care must be taken to pitch upon such a place, as shall give ground to hope that the Bridge may be perpetual, and where it may be built with less expence if possible than elsewhere. Wherefore that place must be chosen where the River is shallowest, and where its bed or bottom is even and uniform, that is to say, either of Stone or of Gravel-stone: because (as I said in my first Book, when I spoke of places for laying Foundations) Stone and Gravel are excellent Foundations in Waters. Besides this, swallows and whirlpools ought to be avoided, and that part of the River's bed which is sandy, or has much Clay in it: because being continually mov'd by the Water-floods, they often change the bed; and the Foundations being thus undermin'd, the Work must necessarily fall to ruin. But supposing the bed of the River to be altogether of Gravel and Sand, then the Foundations must be made as I shall direct hereafter when I treat of Stone-Bridges. Regard ought likewise to be had in chusing the situation of a Bridge, that it be in the part of a River where its course is straightest; since the winding and uneven parts of the Banks are exposed to be wash'd away by the Waters, whence the Bridge in such a case would become destitute of Land-tyes, and remain an Island: besides that, in time of Land-floods the Waters draw into those tortuosities all the matter that it washes from the Banks and the Fields; which not being able to move directly forwards, but resting there, it stops other things, and turning towards the Piles, fills up the Arches, whereby the work suffers in such a manner, that by the weight of the Water it falls in time to ruin. You shall therefore chuse such a place for building a Bridge, as may be in the middle of a Country or City, and consequently commodious for all the Inhabitants: as also where the course of the River is direct, and its bed shallow, equal, and uniform. But seeing Bridges are made either of Timber or Stone, I shall discourse both of the one and the other way; and at the same time give the draughts as well of some ancient Bridges, as of some modern ones.

C H A P. V.

Of Wooden Bridges, and what is to be observ'd in the Building of them.

BRIDGES are made of Wood, either for one particular occasion, as for all those accidents which were wont to happen in War (of which sort the most celebrated is that which *Cæsar* built over the *Rhine*) or that they may continually serve for every body's convenience. Thus we read that *Hercules*, when having kill'd *Geryon*, he victoriously drove his Herd thro' *Italy*, built the first Bridge that ever was on the *Tyber*, in the place where *Rome* was afterwards founded, and it was therefore call'd the *boly Bridge*. It was situated on that part of the River where *Ancus Martius* had afterwards made the *Sublician Bridge*, which was likewise all of Timber, and the pieces of it were so artificially join'd together, that it might be taken up, and carry'd whithersoever it should be necessary; neither were there any Nails in it, or Iron for any use. It is not known how it was contriv'd, only Writers say, that it was laid over great pieces of Timber, which supported others, from whence it took its name of *Sublician*, because in the *Volscian* Tongue

The Architecture of A. PALLADIO.

ſongue ſuch pieces were called *Sublices*. This was the Bridge that *Horatius Cocles* defended, ſo beneficially for his Country, and ſo gloriously for himſelf. It was near to *Ripa*, where ſome remains of it may be ſeen ſtill in the middle of the River: for it was afterwards built of Stone by *Emilius Lepidus* when he was *Prætor*, and repair'd by the Emperors *Tiberius* and *Antoninus Pius*. Such wooden Bridges ought to be made very ſubſtantial, and of large pieces of Timber ſtrongly joined together, in ſuch fort that there be no danger of their breaking; neither by the multitude of Men and Beaſts that paſs over them, nor by the weight of Carriages and Artillery, nor yet that they be ruined by Inundations or Floods. Wherefore thoſe which are made at the Gates of Cities (which we call Draw-bridges, becauſe they can be drawn up or let down) are, inſtead of paving, commonly overlaid with Rods and plates of Iron, that they may not be broken or worn by the wheels of Carriages or the feet of Cattle. The pieces of Timber (as well thoſe which are fix'd in the Water, as thoſe which make the length and breadth of the Bridge) ought to be long and thick in proportion to what the depth, the breadth, and the rapidity of the River ſhall require. But becauſe the particulars are infinite, no certain or determinate Rule can be given about them: and therefore I ſhall preſent you with ſome draughts, and ſpecify their proportions, whereby every one, as occaſion offers, or his genius is happy, may take his meaſures, and perform what ſhall be worthy of praiſe.

C H A P. VI.

Of the Bridge order'd by Cæſar to be laid over the Rhine.

JULIUS CÆSAR having reſolv'd to paſs the *Rhine* (as he ſays himſelf in the fourth Book of his *Commentaries*) that the *Germans* might be made ſenſible of the *Roman* Power; and judging that it would neither be a way ſecure in itſelf, nor a thing worthy of him or the People of *Rome*, if he ſhould paſs in boats; he forthwith order'd a Bridge, which was an admirable and moſt difficult piece of work, by reaſon of the largeneſs, depth, and rapidity of the River. But how this Bridge was contriv'd, altho' he expreſſly writes it, is yet a great Controverſy, becauſe we do not perfectly conceive the force of ſome terms in his deſcription; and therefore various draughts have been made of it, according to mens various Ideas. I having likewiſe mention'd it a little higher, I would not let this opportunity ſlip to ſet down the *deſign which I imagin'd about it in my Youth, when I firſt read thoſe *Commentaries*; becauſe, in my opinion, it agrees very much with the words of *Cæſar*: and alſo becauſe it ſucceeded to a wonder, as experience has ſhewn, in a Bridge, which I ſuddenly built over the *Bacchiglione* without *Vicenza*. It is not however my intention hereby to confute the opinion of others, who were all of them moſt learned Perſons, and highly praiſe-worthy, for having left the deſigns of this Bridge in their Books as they underſtood it; thus by their wit and labour greatly facilitating the underſtanding of it to us, that come after them. But before I give my deſign, I ſhall produce the words of *Cæſar*, which are as follows. *Rationem igitur Pontis hanc inſtituit. Tigna bina ſesquipedalia, paululum ab imo præſcuta, dimenſa ad altitudinem fluminis, intervallò pedum duorum inter ſe jungebat. Hæc cum machinationibus*

immiſſa

* Plate II.

Chap. 6. *Of the Bridge order'd by Cæsar to be laid over the Rhine.* 85

*immissa in flumen defixerat, festucisque adegerat; non publicæ modo directæ ad perpendicularum, sed prona ac fastigiata, ut secundum naturam fluminis procumbere-
rent. His item contraria duo, ad eundem modum junctæ, intervallo pedum qua-
dragenum, ab inferiore parte contra vim atque impetum fluminis conversa, sta-
tuebat. Hæc utraque, insuper bipedalibus immixtis, quantum eorum tignorum
junctura trabibus distabat, binis utrinque fibulis ab extrema parte distinebantur:
quibus disclusis, atque in contrariam partem revinctis, tanta erat operis firmi-
tudo, atque ea rerum natura, ut quo major vis aquæ sese incitavisset, hoc arctius
illegata tenerentur. Hæc directæ injecta materia continebantur, ac longioribus tra-
tibuscque consternebantur; ac nihilsecius, publicæ, ad inferiorem partem fluminis
oblique adjungebantur, quæ pro ariete subiectæ & cum omni opere conjunctæ, vim
fluminis exciperent: & aliæ item supra pontem meliori spatio, ut si arborum trunci
fræc navæ, deiciendi operis causa, essent a barbaris missæ, his defensoribus, earum
rerum vis minueretur, neu ponti nocerent.* The sense of these words is, that he
order'd a Bridge in this manner. He join'd together two pieces of Timber, each
a foot and a half thick, distant from each other two foot; somewhat sharp to-
wards the lower end, and as long as the depth of the River required. Having by
Engines stuck these pieces in the bottom of the River, he caus'd them to be
ramm'd down, not perpendicularly, but leaning and inclining according to the
course of the River. Over-against these, in the lower part of the River, and at
the distance of forty foot, he fix'd two others join'd together in the same manner,
inclining these against the stream and force of the River. Between these two dou-
ble Piles they laid long summers two foot thick (according to their distance from
each other) which were at each end held fast by two braces, which pressing con-
trary to one another, so great was the strength of the work, and such was the
nature of it, that by how much greater was the force of the Water, by so much
the faster was all link'd together. These summers were join'd with other sum-
mers across them, and cover'd with long Poles and Hurdles. Over and above
this, there were in the lower part of the River Piles or Posts, which sloping against
the Bridge, serv'd for buttresses against the force of the River. There were o-
thers added in the upper part of the River, at a little distance from the Bridge;
that if the Trunks of great Trees or Ships should be let down by the Barbarians to
ruin the Works, the violence of such things should be lessen'd by these defences,
so that the Bridge might not be damag'd. Thus *Cæsar* describes the Bridge by
him laid over the *Rhine*; to which description the following draught seems to me
conformable. The principal parts of it are mark'd by Letters.

- A. The two pieces of Timber join'd together, each a foot and a half thick, some-
what sharp towards the lower end, fix'd in the River not perpendicularly, but
leaning according to the stream, and at two foot distance from each other.
- B. The other two pieces of Timber fix'd in the lower part of the River over
against the pieces now mentioned, and forty foot distant from them, but
leaning against the stream.
- C. The figure of one of those pieces by it self.
- D. The pieces of Timber, two foot thick every way, which made the breadth
of the Bridge, which was forty foot.
- E. One of those pieces by it self.
- F. The Braces, which being open, or divided the one from the other, and bound
contrariwise (that is to say, one in the inner part, and the other in the outer
part; one above, and another under the pieces two foot thick, which made the
breadth of the Bridge) did so strengthen the whole work, that the greater the

force of the water, or the heavier any weight was upon the Bridge, the more it united, and the firmer it became.

G. Is one of the braces or ties by it self.

H. The pieces of Timber laid the length of the Bridge, and which were cover'd with Poles and Hurdles.

I. The posts below the Bridge, which leaning against, and join'd to the whole work, resisted the violence of the stream.

K. The posts above the Bridge to defend it, should the Enemy let down the river trees or vessels to destroy it.

L. Two of those pieces of Timber, which, join'd together, stood in the river, not perpendicularly, but leaning.

M. The head of the pieces which made the breadth of the Bridge.

C H A P. VII.

Of the Bridge on the Cismone.

THE *Cismone* is a River, which descending from the Mountains that divide *Italy* from *Germany*, enters into the *Brenta* a little above *Bassano*; and as well because it is most rapid, as that the Mountaneers send down by it great quantities of Timber, a resolution was taken to make a Bridge over it: yet without fixing any posts in the Water, because they were shaken and worn by the violence of the stream, and by the Stones and the Trees which it continually roll'd down; whence Count *Giacomo Angaranno*, who is Lord of the Bridge, was under the necessity of renewing it every year. * The invention of this Bridge is, in my opinion, well worth taking notice of, because it may be serviceable wherever the said difficulties occur; and further, because Bridges so made are solid, beautiful and convenient: solid, because all their parts mutually support each other; beautiful, because the Carpenter's work is very agreeable; and convenient, because they are plain, and in the same line with the rest of the way. The River, where this Bridge stands, is a hundred foot broad. This breadth is divided into six equal parts, and at the end of each part (except at the Banks, which are fortify'd with two solid buttments of Stone) are plac'd the beams which make the bed and breadth of the Bridge; upon which leaving a little space at their extremities, are laid other beams longwise, which make the sides of the Bridge. Over these, plumb with the first, are dispos'd on the one and the other side the *Collonelli* or little pillars; as we vulgarly call those pieces, which, in such works, are set up an end. These little Pillars are fasten'd to the beams (which, as I said, make the breadth of the Bridge) with Iron-cramps, made to pass thro' a hole order'd for this purpose in the heads of the said beams, in that part which advances beyond the pieces that make the sides. These Cramps, because they are in the upper part along the said strait and plain Pillars perforated in several places, and in the under part near to the thick beams we mention'd, and with one hole sufficiently big, went into the Pillars, and fasten'd again below with little Bars or Pins of Iron made for this purpose. Hence the whole work becomes in a manner united, so that the beams which make the breadth of the Bridge, and those of the sides,

are

are as it were one piece with the Pillars; and the Pillars thus come to support the beams which make the breadth, as these again are supported by the arms which reach from one Pillar to another. In this manner all the parts mutually support each other, and their nature becomes such, that the greater weight there is on the Bridge, so much the faster do they close together, and increase the strength of the work. All the said arms, and other pieces of Timber that make up the body of the Bridge, are no more than a foot in breadth, nor in thickness more than three fourths. But those pieces which make the bed of the Bridge, that is such as are laid longwise, are a great deal smaller.

- A. *The elevation of the flank of the Bridge.*
- B. *The solid Stone-work against each Bank.*
- C. *The heads of the beams that go across, or make the breadth of the Bridge.*
- D. *The beams that make the sides.*
- E. *The Collonelli or Pillars, making the rails of the Bridge.*
- F. *The heads of the Cramps, with the pins of Iron.*
- G. *The braces, which bearing contrary to each other, support the whole work.*
- H. *The bottom of the River.*
- I. *The plan of the Bridge.*
- K. *The beams that go across, and advance beyond the sides, near which sides are the holes for the Cramps.*
- L. *The small beams which cover the bed of the Bridge.*

C H A P. VIII.

Of three other Inventions, according to which wooden Bridges may be made without fixing any posts in the Water.

BRIDGES of Wood may be built without any Posts in the Water, like that on the *Cismone*, after three other ways, whereof I would not fail giving the designs, because they are of a very fine contrivance: and so much the more, that they will be easily understood by every one who has learnt the terms made use of in the Bridge on the *Cismone*, since these Bridges likewise consist of beams laid across of pillars, of braces, of cramps, and of beams laid longwise, which make the sides. Now Bridges, according to the first invention*, are made thus. Having fortify'd the Banks with solid buttments as far as requisite, at a little distance from them must be laid one of the beams which make the breadth of the Bridge, and then upon it must be dispos'd the beams which make the sides, which with one of their heads are to lay upon the bank, and be made fast to the same. Then upon these, plumb with the beam laid for the breadth, must be plac'd the *Collonelli*, or Pillars, which are to be fasten'd into the said beams with cramps of Iron, and supported by the braces well fix'd in the head of the Bridge, that is, in the beams which make the sides, upon the bank. Afterwards leaving as much space, as shall be left by the said beam for the breadth, to the bank, you must lay the other beam for the breadth, which shall be in the same manner fasten'd to the beams, which are to be laid over it lengthwise, and also to the pillars, as the pillars will be supported by their braces. And thus must it be done from one end to the other, or as far as it will be necessary, observing always in such Bridges, that

* Plate IV.

in the midst of the breadth there be a pillar whose braces shall meet over against one another, and in the upper part must be put other beams, which reaching from one pillar to another, will keep them united, and (together with the braces plac'd in the head of the Bridge) they will make a portion of a circle less than a semicircle. Thus making every brace bear up its pillar, and every pillar the cross beam, and those that make the sides, every part bears its own weight. Such Bridges are large at their heads, and grow narrower towards the middle of their length. There is none of this sort in *Italy*; but discoursing with Messier *Alexander Picheroni* of *Mirandola*, he told me that he saw one in *Germany*.

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|---|---|
| A. <i>The upright of the flank of the Bridge.</i> | L. <i>The first beams, which at one head are supported by the bank, and at the other by the first cross beam.</i> |
| B. <i>The heads of the beams which make the breadth of it.</i> | M. <i>The second beams, which are borne up by the first and second beams of the breadth.</i> |
| C. <i>The beams which are laid longwise.</i> | N. <i>The third beams, borne up by the second and third beams of the breadth.</i> |
| D. <i>The pillars.</i> | O. <i>Cross beams, which make the bed of the bridge.</i> |
| E. <i>The braces, which being made fast in the beams of the length, support the pillars.</i> | P. <i>After these follow the beams which make the breadth, borne up (as I said) by the pillars to which they are fasten'd, and the pillars supported by their braces.</i> |
| F. <i>The beams that bind one pillar to the other, reaching between them, and making a portion of a circle.</i> | |
| G. <i>The buttments upon each bank.</i> | |
| H. <i>The heads of the iron pins.</i> | |
| I. <i>The bottom of the river.</i> | |
| K. <i>The plan of the bridge.</i> | |

THE invention of the * following Bridge has the upper part, which supports the whole weight, made of a portion of a circle less than a semi-circle; and has the braces which go from one pillar to another so made, that they cross each other in the midst of the space between the pillars. The beams which make the ground or bottom of the Bridge, are fasten'd to the pillars by cramps, as in the former invention. For a greater strength two beams may be added at each end of the Bridge, which being so fasten'd in the pilasters at one end of their heads, come leaning with the other head under the first pillars, because such would help much to bear up the weight of the Bridge.

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| A. <i>The upright of the Bridge in flank.</i> | <i>Bridge at each head, help to bear up the weight.</i> |
| B. <i>The beams which make the sides of the Bridge.</i> | F. <i>The braces which serve as rails to the Bridge.</i> |
| C. <i>The heads of the beams which make the breadth.</i> | G. <i>The pillars.</i> |
| D. <i>The heads of the iron pins.</i> | H. <i>The buttments against each bank.</i> |
| E. <i>The beams, which plac'd under the</i> | I. <i>The bottom of the river.</i> |
| | K. <i>The bed of the Bridge.</i> |

BRIDGES of this † last invention may be made with a greater or a lesser Arch than what is shewn by the draught, according as shall be found necessary from the quality of the situation, and the greatness of the River. The height of the Bridge, in which are the rails or braces that go from one pillar to another, will be the eleventh part of the breadth of the River. All the radii or lines of the pillars

pillars must correspond to the center, which will make the work very strong; and the pillars will bear up the beams laid athwart and along the Bridge, as in the foregoing ones. The Bridges of these four kinds may be made as much in length as occasion shall require, but all their parts must be made proportionably greater.

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|---|--|
| A. <i>The upright of the Bridge in flank.</i> | E. <i>The heads of the beams which make the breadth of the Bridge.</i> |
| B. <i>Its bottom or bed.</i> | F. <i>The heads of the iron pins.</i> |
| C. <i>The pillars.</i> | G. <i>The buttresses against each bank.</i> |
| D. <i>The braces which support the pillars.</i> | H. <i>The bottom of the river.</i> |

CHAP. IX.

Of the Bridge of Bassano.

NEAR *Bassano*, a place at the foot of the *Alps* which separate *Italy* from *Germany*, I have order'd the wooden Bridge that follows * over the *Brenta*, a most rapid River, that empties itself into the Sea near *Venice*, and was call'd by the ancients *Meduacus*, to which (as *Livy* relates in his first *Decad*) *Cleonymus* the *Spartan* came with a Fleet before the *Trojan War*. This River, in the place where the Bridge is built, is in breadth one hundred and eighty foot. This breadth is divided into five equal parts, because the two banks being well fortified with beams of Oak and Larix, there were four rows of piles placed in the River, distant every row from another thirty-four foot and a half; each of these rows consist of eight piles thirty foot long, a foot and a half thick every way, and two foot distant from each other: whence the whole length of the Bridge came to be divided into five spaces, and its breadth to be twenty-six foot. Over these rows of piles were plac'd Joyfts, long in proportion to the said breadth (those Joyfts so placed are vulgarly call'd cross-pieces) which being fasten'd into the Piles fix'd in the River, keep them all join'd and united together. Over these cross pieces, plumb to the said Joyfts, were placed eight other Joyfts, according to the length of the Bridge, and reaching from one row to the other: and by reason that the distance between these rows is very great, whence the Joyfts laid longwise might difficultly bear any great weight that should come over them, there were placed between these and the cross pieces certain beams that serve as shouldering pieces to bear part of the weight. Besides this, there were other beams, which being made fast in those Piles that stood in the River, and leaning one towards the other, came to be join'd to another beam placed in the middle of the said distance under each of the beams of the length. These leaning beams so order'd represent a portion of a circle rising the fourth part of its diameter. And thus the work becomes beautiful as to its form, and strong withal, by reason the beams, which make the length of the Bridge, come to be double in the midst. Over these, and across them, are put other beams, which make the bed or bottom of the Bridge, projecting their heads a little beyond the rest of the work, and they appear like the modillions of a Cornice. On the one and the other side-beams of the Bridge are placed the Pillars which support the roof, and make it serve for a Gallery; all which render the whole work most convenient and beautiful.

- A. *The upright of the Flank of the Bridge.*
- B. *The rows of Piles standing in the Water.*
- C. *The heads of the cross pieces.*
- D. *The beams which make the length of the Bridge, and over which may be seen the heads of the joists that make the ground of it.*
- E. *The beams, which leaning towards each other, go to unite themselves with other beams placed in the middle of the distance between the rows of Piles, whence in that place the beams come to be double.*
- F. *The Pillars that support the roof.*
- G. *The elevation and section of one end of the Bridge.*
- H. *The plan of the rows of Piles with their spurs, keeping the said Piles from being hurt by the Timber that floats down the River.*
- I. *The scale of sixty foot, by which the whole work is measur'd.*
- K. *The surface of the Water.*

C H A P. X.

Of Bridges of Stone, and what ought to be observ'd in the Building of them.

AT first men made Bridges of Wood, as having a regard only to their present necessity: but when they begun to think of immortalizing their names, and that their minds were enlarg'd by riches, and furnish'd with conveniences for attempting greater matters, they begun also to make Bridges of Stone; which are more durable and expensive, as well as more glorious for the Builders of them. In such Bridges four things are to be chiefly consider'd, *viz.* the heads, which are made at the banks; the piles, or pilasters, which are founded in the River; the arches, supported by these pilasters; and the pavement made over the arches. The heads of Bridges ought to be made the most firm and solid that can be; since they not only serve to support the weight of the arches, as do the other pilasters, but that moreover they keep the whole Bridge together, and keep the arches from cracking or opening. For this reason they are made where the banks are of Stone, or at least of solid Earth: and there being no banks of earth naturally solid enough for this purpose, they must be made strong and firm by art, adding other arches or buttresses; so that if the bank should happen to be destroy'd by the water, yet the way to the Bridge might not be interrupted. The pilasters, which are to be made according to the largeness of the River, ought to be of an even number; as well because we see that nature has produc'd from this number all those things, which, consisting of more than one part, are to bear any weight, as the feet of men and all other animals may convince us: as likewise because such a compartment is more beautiful to look upon, and renders the work stronger, since the course of the river in the middle (in which place it is naturally most rapid for being farthest from the banks) is thus free, and does not endamage the pilasters by continually shaking them. The pilasters therefore ought to be so comparted, as to fall into that part of the river where the stream is least rapid. The greatest course of the water is, where those things come together that swim upon it, which at the rising of floods is most easily discern'd. The foundations of Bridges must

be

be made at the time of the year when the waters are lowest, which is in autumn: and if the bottom of the River be of Stone, or Gravel-stone, or any soft Stone, which (as I said in the first Book) is a sort of Earth which is partly Stone, you have the foundations made to your hand, without any fatigue of digging, because these are excellent foundations by nature. But if the bottom of the River be of Sand or Gravel, you must dig in the same till you come to solid ground: or if this should prove a difficult task, you must dig pretty deep in the Sand or Gravel, and then you must thrust in piles of Oak, which, with the iron whereby their points are to be arm'd, will reach the solid and firm ground. To lay the foundation of the pilasters, one part only of the bed of the River ought to be enclos'd from the Water, and then to build there, that, the other part being left open, the Water may have its free course; and so to proceed from part to part. The pilasters ought not to be less in dimension, than the sixth part of the breadth of the arch; nor, ordinarily speaking, greater than a fourth. They ought to be made of great Stones, which are to be join'd together with cramps and bars of iron, fasten'd with Lead; that by such ligaments they may be, as it were, all of one piece. The fronts of the pilasters, or the side that faces the stream, are wont to be made angular, that is, that they terminate in a right angle; and sometimes they are made semicircularly, to the end they may divide or break the Water, and that such things as are impetuously brought down the River, striking against them, may be shov'd from the pilasters, and pass thro' the middle of the arch. The arches ought to be made very firm and strong, and with great Stones well joined together, that they may be able to resist the continual passing of carriages, and resist any weight that shall happen to come over them. Those are the strongest of all arches, which consist of a semicircle, because they entirely rest upon the pilasters, without pressing each other: but if by reason of the nature of the situation, and the disposition of the pilasters accordingly, a perfect semicircle should not be convenient, as rendering the ascent and descent difficult, we must then make use of a lesser section, making such arches as rise only the third part of their diameter; and in this case, the foundations on the banks must be made extremely strong. The pavement of these Bridges ought to be made in the very same manner with those of Ways and Streets, whereof we have treated above. And now having seen what is to be consider'd in general about building Stone-Bridges, 'tis time we proceed to particular draughts and designs.

C H A P. XI.

Of certain famous Bridges built by the Ancients, with the draughts of the Bridge of Ariminum.

MANY Bridges were built by the Ancients in divers places; but in *Italy*, and especially on the *Tyber*, there were abundance; whereof some may be seen yet entire, and of others remain only the ancient vestiges. Those which are to be still seen entire on the *Tyber*, are that of the Castle of *St. Angelo*, formerly call'd the *Elian Bridge*, from the Emperor *Elius Adrianus*, who built here his own Sepulchre: The *Fabrician Bridge*, built by *Fabricius*, now call'd Four-head Bridge, or *Ponto quattro capi*, from the four heads of *Janus*, or of four
Termini

Termini which are plac'd on the left hand as you go on this Bridge, by which the Island of the *Tyber* is join'd to the City: The *Cestian Bridge*, at this day the Bridge of *St. Bartholomew*, which from the other side of the Island passes to *Transsevere*, or over *Tyber*: The Bridge call'd *Senatorio*, from the Senators, and *Palatino* from the neighbouring Hill, made of rustick work, and now call'd the Bridge of *St. Mary*. But the Bridges, whereof only the ancient remains are to be seen in the *Tyber*, are the *Sublician Bridge*, named also the *Lepidan Bridge*, from *Emilius Lepidus*, who, from having been first of wood, made it of Stone, and was near *Ripa*. The *Triumphal Bridge*, whose pilasters are to be seen over-against the Church of the *Holy Ghost*: The *Janiculan Bridge*, so call'd from its vicinity to Mount *Janiculus*, which, because repair'd by Pope *Sixtus* the fourth, is now call'd *Ponte Sisto*: and the *Milvian Bridge*, now call'd *Ponte molle*, in the *Flaminian way*, a little less than two miles distant from *Rome*, and retaining of its ancient form only the foundations. It is said to have been built in the time of *Sylla*, by *Marcus Scaurus* the Censor. There are likewise to be seen the ruins of a Bridge built by *Augustus* of rustick work, upon the *Vera*, a most rapid River near *Narni*: and upon the *Metaurus*, at *Calgi* in *Umbria*, is seen another, which is likewise of rustick work, with certain counterworks on the banks at each end of it, which make it exceeding strong, and supporting the Road. But among all the famous Bridges, that is recorded as a miracle which *Caligula* made from *Puteoli* to *Baia*, in the middle of the Sea, almost three miles long; and 'tis said that he laid out upon it all the revenues of the Empire. Extraordinary great, and most deserving admiration, was that Bridge built over the *Danube* in *Transylvania*, and on which were read these words; *PROVIDENTIA AUGUSTI VERE PONTIFICIS VIRTUS ROMANA QUID NON DOMET? SUB JUGORE ECCE RAPIDUS DANUBIUS*. This Bridge was afterwards ruin'd by *Adrian*, that the Barbarians might not come over it to plunder the *Roman Provinces*; and its pilasters are yet to be seen in the midst of the River. But seeing, of all the Bridges that I have observ'd, that appears to me to be the finest, and the most worthy of consideration (as well for the strength as the compartment of it) which was built at *Ariminum*, a City of the *Flaminian Tribe*, and as I believe, by *Augustus Caesar*, I have given the * draughts of it, which are those that follow. It is divided into five arches, whereof the three middlemost are equal, being 25 foot in breadth; and the two next the banks are less, being only 20 foot. All these arches consist of a semicircle, and the depth of their *Archivolte* is a tenth part of the light or void of the greater, and an eighth part of a light of the lesser ones. The pilasters are in thickness a little more than the half of the light of the greater arches. The angle of the spurs, that cut the water, is a right angle: which, as I observe, the Ancients follow'd in all their Bridges, because it is much stronger than the acute angle; and therefore less expos'd to be ruin'd by Trees, or any other matter, that comes down with the stream. Plumb over the Pilasters, there are, on the sides of the Bridge, some niches wherein there must have been formerly Statues. Over these niches, quite the length of the Bridge, is a Cornice, which altho' it be plain, adds nevertheless a most agreeable ornament to the work.

A. The Cornice which is over the niches,
quite the length of the Bridge.
B. The surface of the Water.

C. The bottom of the River.
D. A scale of 30 foot, by which the
whole work is measur'd.

C H A P. XII.

Of the Bridge of Vicenza, that is over the Bacchiglione.

TWO Rivers run thro' *Vicenza*, the one of which is call'd the *Bacchi Fiume*, and the other the *Rerone*. This last just without the City enters into the first, and so immediately loses its name. Over these Rivers are two ancient Bridges. Of that which is over the *Bacchiglione* are seen the pilasters and one arch still entire, near the Church of *St. Mary of the Angels*: the rest is all modern work. This * Bridge is divided into three arches: that in the middle is thirty foot broad, the other two are twenty two foot and a half each; which was so contriv'd, that the River might enjoy its course the freer in the middle. The pilasters are in thickness the fifth part of the light of the lesser arches, and the sixth of the greater. The arches rise from their *Impost*, the third part of the diameter of the void of the arch. Their *Archivolte* has in depth the ninth part of the smaller arches, and the twelfth part of that in the middle, and they are wrought in the manner of an architrave. In the uppermost part of the pilasters, under the impost of the arches, shoot or jut forth certain Stones, which in the building of the Bridge serv'd to support the beams, over which was made the centering of the arches: and thus the danger was avoided of any flood's taking away the posts (to the ruin of the work) which must have been otherwise fix'd in the river for making the said centering.

A. *The parapet of the Bridge.*

B. *The stones that jut out from the top of the pilasters, and serve to bear the centers of the arches.*

C. *The architrave round the arches.*

D. *The heads of the Bridge.*

E. *The architrave round the arches at large.*

F. *Scale of thirty foot, by which this work is measur'd.*

C H A P. XIII.

Of a Stone Bridge of my own invention.

VERY fine, in my opinion, is the design of the † following Bridge, and perfectly suited to the place where it was to be built, which was in the middle of one of the greatest and most celebrated Cities of *Italy*, the metropolis of many other Cities, and trading almost to all parts of the World. The river is very large, and the Bridge was to have been built just at the very spot where the Merchants come together to negotiate and treat of their Affairs. Wherefore, as well to preserve the grandeur and dignity of the said City, as very considerably to encrease the revenues of the same, I design'd the Bridge so broad as to make three Streets upon it; that in the middle large and fine, and the other two on the sides somewhat less. On both sides of each of those Streets I order'd Shops, whereof thus there would have been six ranges. Besides this, there were to have been made galleries at each head of the Bridge, and in the middle over the great arch, wherein the Merchants should keep their exchange, and which would have

V o L. I.

* Plate IX. † Plate X.

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occasion'd

occasion'd no less ornament than convenience. The going to the galleries at the heads should have been by some few steps, and level with these would be the ground, or pavement of the rest of the Bridge. It ought not to appear strange or new, that galleries should be made over Bridges, since the *Eliau* Bridge at *Rome*, whereof we spoke in its proper place, was anciently all cover'd with galleries, having columns of brass, with Statues, and other admirable ornaments: besides that upon this occasion, for the reasons mention'd already, it was almost necessary to make galleries. The self-same order and rules are observ'd in the proportions of the pilasters and the arches, that have been observ'd in the other Bridges aforegoing, and every one may easily find them himself.

The parts of the Plan.

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|--|---|
| <p>A. <i>The beautiful and large street made in the middle of the breadth of the Bridge.</i></p> <p>B. <i>The lesser streets on the sides.</i></p> <p>C. <i>The shops on the outside over the river.</i></p> | <p>D. <i>The galleries at each head of the Bridge.</i></p> <p>E. <i>The steps that lead up to those galleries.</i></p> <p>F. <i>The galleries in the middle, over the great arch of the Bridge.</i></p> |
|--|---|
- THE parts of the elevation correspond to those of the plan, and therefore are easily understood without any further explication.
- | | |
|---|--|
| <p>G. <i>The elevation of the shops fronting all the three ways A.B.B.</i></p> <p>H. <i>The lines of the water's surface.</i></p> | <p>I. <i>A prospect of the ways leading to the small stairs of the Bridge.</i></p> |
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C H A P. XIV.

Of another Bridge of my invention.

BEING requested by some Gentlemen to give them my opinion about a Bridge which they intended to build of Stone, I made the following draught * for them. The river, at the place where the Bridge was to be built, is one hundred and eighty foot broad. I divided this whole breadth into three arches, and made that in the middle sixty foot broad, as each of the others forty eight. The pilasters which govern and support the arches were twelve foot thick, and so were a fifth part of the middle arch, and a fourth of the lesser ones. On this occasion I somewhat vary'd from the common measures of pilasters, making them very thick, and to jut very far from the body of the Bridge; that they might the better resist the force of the river, which is extremely rapid, and also resist the Stones and Trees which roll down with the stream. The arches were to have been a portion of a circle, less than a semicircle, that the ascent and descent of the Bridge might be plain and easy. I made the *Archivolte* of the arches a seventeenth part of the void of the middle arch, and a fourteenth of the other two. This Bridge might have been adorn'd with niches over the pilasters, and with Statues; as there might reign a cornice the whole length of it on each side, which the ancients are known to have done sometimes, as in the Bridge of *Ariminum* made by *Augustus* Caesar, the draughts of which are given above.

A. *The superficies of the water.*

B. *The bottom of the river.*

C. *The*

- C. *The stones that jut out, for the uses above-mention'd.* D. *The scale of forty foot, by which the whole work is measur'd.*

C H A P. XV.

Of the Bridge of Vicenza, that is over the Rerone.

THE other ancient *Bridge, which, as I said before, is in *Vicenza* over the *Rerone*, is vulgarly call'd *il ponte belle beccarie*, or the Butchers Bridge, because it is near the greatest shambles of the City. This Bridge subsists entire, and differs little from that on the *Bacchiglione*; for this is likewise divided into three arches, whereof the middlemost is larger than any of the other two. All these arches are a portion of a circle less than a semicircle, and have no ornaments at all. The lesser ones rise above their impost the third of their breadth, and that in the middle a little less. The pilasters are in thickness the fifth part of the diameter of the lesser arches, and have at their extremities, under the imposts of the arches, the Stones that jut out for the uses before-mentioned. Both the one and the other of these Bridges are made of *Cosizza* Stone, which is a soft Stone, and is saw'd like wood. Of the same proportions with these two at *Vicenza*, are four in *Padua*, three of which have only three arches; and they are the Bridge of *Altina*, that of *St. Lawrence*, and that which is call'd *Pontecorvo*, or Raven-Bridge: the fourth which is call'd *Ponte molino*, or Mill-Bridge, has five arches. In all these Bridges it is to be observ'd, that the greatest care has been taken to join well the Stones, which, as I have often advis'd, is absolutely necessary in all Buildings.

- A. *The side of the Bridge.* C. *Pilasters or buttresses at each bank.*
B. *Projecting Stones to bear the centers of the arches.* D. *Scale of forty foot, with which this Bridge was measur'd.*

C H A P. XVI.

Of the chief Squares, Markets, and open places of a City, and the Edifices that ought to be made about them.

BESIDES the Streets, of which we have treated above, it is also requisite that there be distributed in Cities, proportionably to their extent, greater or lesser Squares, or open places, where People may come together to treat about their useful and necessary affairs. But since such places may be destin'd to different purposes, so a proper and convenient situation ought to be assign'd to each of them. The leaving those great and open places in a City, over and above the foresaid conveniences of walking, discoursing, and bargaining, brings withal very great ornament along with it; as when there is at the head of a Street a beautiful and spacious place, from which you have the prospect of some fine Building, and especially of some Church. As it would be advantageous to have several such places

in

* Plate XII.

in different parts of the City, so it is much more necessary, as well as honourable and magnificent, that there be one principal Square, which may truly deserve the name of a publick place. These principal Squares ought to have dimensions in proportion to the number of the People; that they may be neither too small for their uses and conveniencies, or that being too great, the place may not seem uninhabited. In maritime Cities they ought to be made near the haven, and in inland Cities about the middle of the same, that the Citizens may conveniently come to them from all parts. They ought to be design'd after the manner of the ancients. Round these Squares should be large porticos in proportion to the height of their columns: the use of which is to avoid Rain, Snow, and every injury we may receive from the Air or the Sun. But all the Edifices built round them, ought not to be (according to *Alberti*) higher than the third part of the breadth of the Square, nor lower than the sixth. To the porticos there must be an ascent by steps, which are to rise the fifth part of the height of the columns. Squares receive extraordinary beauty from arches erected at the entrance into them, that is, at the head of the Streets that go out of them. How such arches should be built, why they were anciently made, and whence denominated *Triumphal*, I shall shew at large in my *Book of Arches*, where the draughts of many of them will be found; and whereby great light will be imparted to those who would at this time, or hereafter, erect such arches to the honour of Princes, Kings, and Emperors. But to return to the principal Squares, to these ought to be join'd the Prince's Palace, or that for the meeting of the States, as the Country is either a Monarchy or a Republick. The Exchequer or the publick Treasury, where the Money and Treasure of the publick is lodg'd, ought to join them likewise, as well as the Prisons. These latter were anciently of three sorts; one for such as were debauch'd and immodest, who were detain'd there till they were reform'd, and which we now assign to Fools or mad Folks: another was for Debtors, which is also in use among us: and the third was for Traitors and other wicked Persons, either already condemn'd, or to be condemn'd. These three sorts are sufficient, since all the faults of Men proceed either from immodesty, or contumacy, or perversity. The Exchequer and the Prisons ought to be situated in very secure places, surrounded with high Walls, and guarded against the violence or treachery of the seditious Inhabitants. The Prisons in particular ought to be built healthy and convenient, because they are ordain'd for the safe custody, and not for the punishment or execution of the wicked or any other sort of delinquents. Wherefore the Walls of them should be made in the middle with great Stones, bound together with cramps, and fastenings of Iron or Copper, and then be lin'd on both sides with Bricks: for in so doing the humidity of the Stones will not render the Prison unhealthy, nor the Walls lose any of their strength. Passages ought to be made round them, and the Apartments of the Keepers be near at hand; that if the Prisoners contrive any thing, it may be quickly perceiv'd. Besides the Exchequer and the Prisons, the Senate and Council-house, where matters of State are transacted, should join the great square. The Senate-house ought to be spacious, and proportionable to the dignity and number of the Inhabitants. If it be square, the height must exceed the breadth of it by near one half; but if it be oblong, it must be half as high to the roof, as the length and the breadth put together. In the middle of the height ought to be made large cornishes projecting from the Walls; to the end that the voice of those who debate may not be dilated in the height of the room, but, being reflected back, may the better reach the ears of
the

the auditors. On the side of the Square that is towards the warmest region of Heaven, should be made the *Basilica*, or the fabrick for the Courts of Justice, whither a great part of the People resort, especially People of business: but I shall discourse particularly of the *Basilica's*, after I have shewn how the *Greeks* and the *Romans* made their Squares, and that I have given the draughts of each.

C H A P. XVII.

Of the Squares, or Agora's of the Greeks.

THE *Greeks* (as we are inform'd by *Vitruvius* in the first Chapter of his fifth Book) made the *open places in their Cities of a square form, encompassing them with ample and double porticos, and thick columns; that is to say, distant from each other a diameter and half of a column, or at the most two diameters. These Porticos were as broad as the columns were long; so that by reason of their being double, the place for walking was as spacious as twice the length of a column, which made it very convenient. Over the first columns (which, regard being had to the place where they stood, must, in my opinion, have been *Corinthian*) were other columns, a fourth part less than the first. These had under them a Corridor of the height that convenience requir'd: because these upper porticos were likewise destin'd for walking and discoursing, and for persons to stand commodiously in them to behold any shews that might be exhibited in the Square, either out of devotion or pleasure. All these porticos must of course have been adorn'd with niches and statues, since the *Greeks* used to be highly delighted with such decorations. Near to these Squares were the *Basilica*, the Senate-house, the Prisons, and all the other places we mention'd above: tho' *Vitruvius*, when he teaches how they ought to be built, does not name that place for them. Moreover, because (as he says in the seventh Chapter of his first Book) the Ancients used to build near their Squares the Temples consecrated to *Mercury* and *Isis*, as being Gods presiding over Traffick and Merchandize; and that in *Pola* a City of *Istria* there are to be seen two Temples upon the great Square, wholly like one another in form, bigness, and ornaments: I have inserted them in the following draught on each side of the *Basilica*. Here follow the plan and the elevation, of which, with all their particular members, you'll see a more distinct account in my Book of Temples.

* The *Greek* Architecture is fitter for us, than that of the *Romans*; for their Buildings were for Use, and not so profuse.

- | | |
|--|---|
| A. The Square, Agora, or great place. | I. The gate of the hall, from which people pass into the Senate-house. |
| B. The double porticos. | K. Passages round the Senate-house, by which people came to the porticos of the square. |
| C. The Basilica, where the judges had their tribunals. | L. The turning or corners of the porticos of the square. |
| D. The temple of Isis. | M. The turning of the porticos on the inside. |
| E. The temple of Mercury. | N. The plan of the walls of the little courts of the temple. |
| F. The Senate-house. | |
| G. A portico and small court before the treasury. | |
| H. A portico and small court before the prisons. | |

VOL. I.

D d

O. Passages

O. *Passages round the Exchequer and the Senate-house.*

The elevation that is on the back of the

plan *, is of one part of the Square.

Q. *Half of the breadth of the portico towards the Square.*

C H A P. XVIII.

Of the Squares and Forums, or open Places and Markets of the Romans.

THE Romans and the other *Italians* (as *Vitruvius* affirms in the place above quoted) departing from the usage of the *Greeks*, made their † Squares longer than they were broad; so that dividing the length into three parts, two of them made the breadth: because the spectacle of the gladiators being exhibited in these places, this figure was more convenient for their purpose than a perfect Square: for which reason likewise they made the inter-columnation of the porticos, that went round the Square, of two diameters and a quarter of a column, or even of two diameters, that the view of the People might not be hinder'd by the thickness of the columns. The porticos were as broad as the columns were high, and under them were the Bankers and Goldsmiths shops. The upper columns were a fourth part less than the under ones; because, as I have taught in my first Book, all pieces below, considering the weight that they bear, ought to be stronger than those above. In that part which fronted the warmest region of heaven, they plac'd the *Basilica*; which I have mark'd in the draughts of those Squares in the length of two Squares, and the porticos round the inside are broad a third part of the middle space. Their columns are as long as the porticos are large, and may be made of what order one pleases. On the side fronting the north I have placed the Senate-house, a square and a half in length. The height of it is half its breadth and length put together. This *Curia* or Senate-house (as I said above) was the place where the Senate met to consult about affairs of State.

A. *Winding stairs, open in the middle, and leading to the upper parts.*

B. *A passage by which people enter'd into the porticos of the Square.*

C. *Porticos, and a little court on one side the Basilica.*

D. E. *Places for the Bankers, and the most reputable Trades of the City.*

F. *Places for the Secretaries, where were repositd the deliberations and resolutions of the Senate.*

G. *The Prisons.*

H. *The turning or corners of the porticos of the Square.*

I. *The entrance into the Basilica, or Courts of Justice, by one side.*

K. *The turning of the porticos of the little Courts on one side of the Basilica.*

The elevation that follows ** on a larger scale, is a part of the porticos of the Square.

L. *Half of the breadth of the portico towards the Square.*

* Plate XIV. † Plate XV. ** Plate XVI.

C H A P. XIX.

Of the ancient Basilicas, or Courts of Justice.

THESE places* were anciently call'd *Basilicas*, where the judges attended to do justice under covert, and where sometimes great and important affairs were transacted: whence we read, that the *Tribunes* of the People caused to be taken away a column that interrupted their benches, from the *Basilica Portia*; which was at *Rome* near the Temple of *Romulus* and *Remus*, and is now the Church of *St. Cosinus* and *Damianus*. Of all the ancient *Basilicas* that was the most celebrated, and reckon'd one of the wonders of the City, which *Paulus Emilius* built between the Temples of *Saturn* and *Fauftina*; and upon which he expended a thousand five hundred talents bestow'd on him by *Cæsar*, which amount, as well as we can compute, to nine hundred thousand Crowns. *Basilicas* then ought to be join'd to the Square, as I have observ'd in those already mention'd, both which stood in the *Roman Forum*, and were turn'd to the warmest region of Heaven: that the People of business, and those who were at Law, might come together in the spring time, and continue there conveniently. In breadth they ought to be no less than a third part of their length, nor more than the half; I mean if the situation of the place permits it, and that you are not forc'd to change the measures of your compartment. Of no such ancient Edifice is there the least vestige remaining: wherefore, following the directions of *Vitruvius* about them in the place before-mentioned, I have made the following draughts†; in which the *Basilica* in the middle part of it; that is, within the columns, is in length two squares. The porticos that are on the sides, and at the end of the entry, are in breadth a third part of the middle space. The columns are as high as the porticos are large, and may be made of what order you will. I have made no portico in the end opposite to the entrance, because, in my opinion, it would be better to have there a great nich, made of a portion of a circle less than a semicircle, where might stand the *Prætor's* Tribunal, or that of the Judges, if there be many; as there should be an ascent to it by steps, that it might have the more of Majesty and Grandeur. I deny not in the mean time, but the porticos might reach quite round, as I have done in the designs of those *Basilicas*, which are in the draughts of the squares. You go along the porticos to the stairs, which are on each side of the said nich, and leading you to the upper porticos. These upper ones have their columns a fourth part less than those below. The corridor which is between the upper and the lower columns, ought to be in height a fourth part less than the length of the upper columns; that they, who are about their business in the upper porticos, may not be seen by those who are busy below in the *Basilica*. The foremention'd *Vitruvius* made a *Basilica* at *Fano*, with other compartments, which, according to the proportions he gives of it in the place above quoted, must have been an Edifice of great beauty and magnificence. I had inserted the draughts of it here, but that the most reverend *Barbaro* has with the greatest industry done it in his *Vitruvius*.

- | | |
|---|---|
| A. The Entrance into the Basilica. | D. The stairs that lead to the upper parts. |
| B. The nich for the Tribunal over against the entrance. | E. Houses of Office. |
| C. The porticos round the Basilica. | |

Of

* Plate XVII. † Plate XVIII.

Of the following *designs at large the 18th plate represents the inside of the colonnade towards the *Basilica*, and the 19th shews half of the nich for the Tribunal over-against the entrance of the *Basilica*.

CH A P. XX.

Of the Basilicas, or Courts of Justice of our own times.

AS the Ancients † made their *Basilicas* after such a manner, that in the Spring and Summer People might come together there, to treat of their affairs, and to carry on their Law-suits; so in our times every City, both in *Italy* and out of it, do erect certain spacious publick Halls, which may be deservedly term'd *Basilicas*: because that near to them is the residence of the supreme Magistrate, whence they come to be part of the same; and the proper signification of this word *Basilica* is a royal House, as well for the reason now given, as by reason the judges attend there to administer justice to the People. The *Basilicas* of our times are different herein from the ancient *Basilicas*, that the latter were on the ground, or level with the surface of it; whereas the former are over arches, in which Shops are placed for several Arts and Merchants wares; the Prisons being likewise there, and other places for the service of the publick. Moreover, the ancient *Basilicas* had their porticos on the inside, as may be perceiv'd by our draughts; and the modern ones, on the contrary, either have no porticos at all, or they have them on the outside towards the square or open place. Among these modern Halls, there is one very remarkable in *Padua*, (a City illustrious for its Antiquity, and famous over the whole World for its Univerfity) in which the Gentlemen meet every day, this place serving them for a cover'd square to walk in. The City of *Brescia*, which is magnificent in all its undertakings, has lately built one of those Halls, admirable for its grandeur and ornaments. There is another of them in *Vicenza*, of which alone I have given the draughts, because the porticos around it are of my own invention: and that I make no doubt, but that this Edifice may be compar'd to the ancient Fabricks, and be reckon'd among the noblest and most beautiful Buildings erected since the time of the ancients; as well on account of its largeness and ornaments, as of its matter, which is all hewn Stone, extremely hard, join'd and bound together with the utmost care. There is no need I should particularize the proportions of every part here, because they are all mark'd in their places on the draughts.

*Part of the Plan***, and of the elevation of the *Basilica at large*.

* Plate XVIII. and XIX. † Plate XX. ** Plate XXI.

C H A P X X I .

Of the Palestras and the Xisti of the Greeks, or places of publick exercise.

AFTER having treated of Ways, Streets, Bridges, and Squares, it remains that we now discourse of certain Edifices made by the *Greeks*, to which Men repair'd to exercise their Bodies; and 'tis very probable that, when the Cities of *Greece* were govern'd after a Republican form, there was one of these Edifices in each of those Cities; wherein the youth, besides learning the Sciences, by exercising of their bodies in a military manner (as in knowing their ranks, in throwing the bar or javelin, in wrestling, in managing their arms, in swimming with burdens on their backs, and the like) became inur'd to the fatigues and accidents of War, whereby, tho' few in number, they could afterwards with their valour and military discipline beat numerous Armies. After the example of the *Greeks*, the *Romans* had their *Campus Martius*, or field of *Mars*, wherein the youth publickly exercised themselves in the said military Actions; from whence proceeded wonderful Effects, and many a glorious Victory. *Cæsar* writes in his *Commentaries*, that being suddenly attack'd by the *Nervii*, and seeing that the seventh and twelfth legions were so close and crouded that they could not fight, he commanded them to set themselves more at large, and that the one should flank the other, that so they might have room to handle their Weapons, and not be hem'd in by their Enemies: which being with great speed and dexterity perform'd by the Soldiers, obtain'd the victory for their General, and purchased to themselves the immortal fame of valiant and well-disciplin'd Men, since in the heat of the battle, when every thing was full of danger and confusion, they did that which in our time seems to many extraordinary difficult to perform, even when there's no Enemy near, and where there's convenience both of time and place. The *Greek* and *Roman* Histories are full of such glorious Atchievements, whereof questionless the principal cause consisted in the continual exercise of the youth. From these exercises the said places (which the *Greeks* built, as *Vitruvius* relates in the eleventh Chapter of his fifth Book) were call'd *Palestræ* and *Xisti*, and they were comparted in the following manner. First they traced or measur'd out a square place of the compass of two 'stadcs, that is, of two hundred and fifty paces; and on three sides of it they made single porticos, under which were spacious Rooms, wherein Men of Letters, as Philosophers and the like, reason'd and disputed together. On the fourth side, which look'd to the South, the porticos were made double, that the Rain driven by the wind might not in the spring time reach the inner parts, and that the Sun might be kept farther off in the Summer. In the middle of this portico was a very large Hall, a square and a half in length, where the Boys were taught, on the right of which was the place where the Girls were also taught; and behind it the place where the Wrestlers covered themselves with dust. Further on was the room for washing in cold Water, which we now call a cold Bath, and happens to be in the turning or corner of the portico. On the left of the Hall for the youth, was the place where the Wrestlers anointed their Bodies to become the stronger, near to which was a cold room, where they put off their clothes; and further on a lukewarm Room, wherein was made a Fire, and from which they enter'd into the hot stove. This room had on the one

* *Palladio* varies from *Herodotus* lib. 2. fol. 68. in the measuring of the *Stadium*; for in *Herodotus* it is 125 Paces.

side of it the *Laconicum*, or sweating-place, and on the other side the room for washing in cold Water. For this wise People would imitate nature, which proceeds thro' several mediums from extreme cold to extreme heat; and therefore they would not suddenly go from the cold Room into the hot, but by the interval of the lukewarm one. Without all these places were three porticos, one on the side of the entrance (which may be made East or West) and the other two were on the right and left, the one to the North, the other to the South. The portico towards the North was double, and as large as its columns were long: that towards the South was single, but much broader than any of those we have mention'd, and was so divided, as that leaving on the side of the columns and of the Wall ten foot (which space is by *Vitruvius* call'd the *margin* or border) they descended by two steps six foot broad into a plain place not less than twelve foot, wherein the Wrestlers and others might in the spring exercise their bodies under cover, without being hinder'd by those who were in the porticos to look on; who likewise saw better, by reason of the largeness of the place where the Wrestlers were. The portico was properly call'd the *Xistus*. The *Xisti* were so made, that between the porticos there should be Woods and Plantations, and the ways between the Trees paved with *Mosaic* work. Near the *Xistus* and the double Portico were traced the open places for walking, by them called *Peridromides*, wherein in the spring time, when the Weather was fair, the *Athletes* might exercise themselves. The *Stadium* was on one side of this Edifice, and was a place from whence People might commodiously see the *Combatants* and Performers of other Exercises. From these sort of Edifices the example was taken by the *Roman Emperors*, who built the *Thermæ* or publick Baths to delight and please the People; these being places whither Persons went to divert as well as to wash themselves, and whereof, if it pleases God, I shall discourse in the following Book.

- A. *The place where the Boys were taught.*
- B. *The place where the Girls were taught.*
- C. *The place where the Wrestlers dusted themselves.*
- D. *The cold Bath.*
- E. *The place where the Wrestlers anointed themselves.*
- F. *The cold Room.*
- G. *The Luke-warm Room, from whence they went into the stoves.*
- H. *The warm Room.*
- I. *The Laconicum, or Sweating-place.*
- K. *The warm Bath.*
- L. *The outer Portico before the entrance.*
- M. *The outer Portico towards the North.*
- N. *The outer Portico towards the East, where they exercised in the spring, and is called the Xistus.*
- O. *The Woods between two Porticos.*
- P. *Open places for walking, call'd Peridromides.*
- Q. *The Stadium, where the multitude stood to see the Combatants.*
- The other places in the draught are Exhedræ and Schools.*
- LL. *The East.*
- OO. *The South.*
- PP. *The West.*
- TT. *The North.*

E N D of the Third Book.

NOTES and REMARKS of INIGO JONES upon the
Plates of the Third Book of *PALLADIO*'s Architecture :

Taken from the Manuscript of the said INIGO JONES, in the Library of
Worcester-College, Oxford, June 23, 1741.

PLATE I. In my Journey to *Naples* I have seen one of these Ways; but the Horleway on the side of the Foot-way is not to be seen.

PLATE III. A. The Side of the Bridge. B. The Pilaster is the Basement against the Bank of the River.

C. The Heads of the Timber is the Breadth of the Bridge.

This Timber D. is the Plan of the Bridge.

E. Colonelli of the Sides of the Bridge.

F. The Bolts and Forelocks of Fir, that fasten the Timber with the Colonelli, and makes the Breadth of the Bridge.

G. The Braces thrusting together, which bears up all the Work.

M. The Holes made in the Timber for the Iron Bolts to pass thro'.

PLATE VII. L. The Projection of the Planks.

M. The Sides of the main Beams. N. The

Sides of the under Beams. O. The Sides

of the Braces. P. The Plate on the Heads

of the under Posts, which are worked narrower upwards. Q. The under Posts. R.

The Plate which is letter C, in the upright,

and it's Projection in the Front and in the

Profile. S. The Spurs.

PLATE VIII. A. This Modillion Cornice is along the Bridge over the Arches.

This Cornice is in height the sixth part from

the Spring of the Arches E. to the Soffita

of the Arches, and it is divided into two

equal Parts, one is given to the Modillions

and Fillet under it: The other one is di-

vided into three equal Parts, one is given

to the Intavolato over the Modillions; and

the other two to the Wave and Regolone,

which is to be subdivided into five; three

is given to the Wave, and two to the Reg-

olone.

The Modillions are square, and project out as

much as the Intavolato.

PLATE IX. G. This is the Center of the

Arches.

C. The Architrave of the middle Arch is $1\frac{1}{4}$

part of the opening of the said Arch.

The Architrave of the two Side-Arches are

$\frac{1}{2}$ Part of their Opening.

The Piers H. are the 5th Part of the Width

of the small Arches, and the 6th of the

middle Arch.

PLATE XI. From this one *Scamozzi* took his for the *Corinthian* Order, Lib. 6. Fol. 127.

PLATE XIII. B. These Porticos have their

Cielings flat.

M. These double Pilasters in the Lodge, I

think they diminish the same as the Co-

lumnus, as *Palladio* does diminish his, and

also *Scamozzi*, and has a Court before the Temple with Columns and Niches.

E. D. These Temples are the same as those of the Temple of *Pola*.

PLATE XIV. The upper Columns are shorter

$\frac{1}{2}$ part than the under ones, and the Archi-

trave, Freeze and Cornice bears it's Propor-

tions; in this *Palladio* follows *Vitruvius*,

and he is blamed by *Scamozzi* for making

the upper Order so short; but in this, as in

most other things else, *Scamozzi* errs, be-

cause in the Palace of *Montano Barbarano*,

Lib. 2. Plate 18. the second Order is $\frac{1}{4}$

part less than the first Order, and *Scamozzi*

gives a Rule that between $\frac{1}{4}$ and $\frac{1}{2}$ the second

Order should diminish; besides, *Palladio* in

the Palace of *Valereo Chiricato*, Lib. 2. Plate

4. the Columns of the second Order are

$\frac{1}{4}$ part and more, less than the Order under-

neath. See the Court of *Charity* at *Venice*,

Lib. 2. Plate 23. Of three Orders, the upper

Order is less by $\frac{1}{4}$.

I have known the Rail and Banisters A.

placed on one side of the Pedestal, and not

in the middle of the said Pedestal, and the

Pedestal level with the Cimasia; for the

Base of the Pedestal B. projects perpendi-

cular on the Modillions C. The Base of the

Rail is set in as much as the Ovolo and

Dentil; which, besides the upper Fillet,

the Height of the Rail is $\frac{1}{2}$ part of the

Height of the Pedestal, so as the Columns

are set on the Pedestal.

They being $\frac{1}{4}$ part less than the under ones,

do not shew so short as they would with-

out Pedestals, and they are more tolerable.

See Plate 30.

In the Temple of *Jove*, Lib. 4. the second

Order of Columns is $\frac{1}{4}$ part shorter than

the first Order; so it plainly shews the Ig-

norance and Malice of *Scamozzi* against

Palladio; but he taxes *Vitruvius*, unto

whom Posterity is beholden for the Know-

ledge of the Art of Architecture, which,

but for him, would have been lost. See

also the Basilica of *Vicenza*, Plate 30. The

upper Columns are $\frac{1}{4}$ part less than the

under ones, so as *Scamozzi* takes the Rule

of lessening the upper Order from *Palla-*

dio, and he taxes him for it.

PLATE XVI. The Columns of the *Corin-*

thian Order are $\frac{1}{4}$ part less than the Co-

lumnus of the *Ionick* Order; the Architrave,

Freeze and Cornice, are in their just pro-

portion.

A. These are two half Banisters between the

Pedestal of the Angle Columns, and shew

where the Rail is to be placed in the Pe-

destal, which Banister should stand per-

pendicular

pendicular to the naked of the Column; the Rail of the Inside is quite plain, without Moldings.

The hollow of the outside of the Rail ranges all along, and answers the hollow at the top of the Cimasia of the Pedestal.

B. This Wave makes a Square and flat in the Soffita of the Portico.

C. The Freeze of the Inside of the Portico is flat, and that of the Outside swells.

D. These are Shops for Goldsmiths, and other fine Trades.

PLATE XXI. The Statues at the top of the *Ionick* Order are in height $\frac{1}{4}$ part of the Co-

lumns, Architrave, Freeze, and Cornice together.

The Eminence A. of the upper part of the Basilica, which rises above the Terrace.

The Columns of the *Ionick* Order are shorter $\frac{1}{4}$ part than the *Dorick* Order.

PLATE XXII. R. An open Place with Columns, with Arches over them, as in the *Therma* of *Dioclesian*.

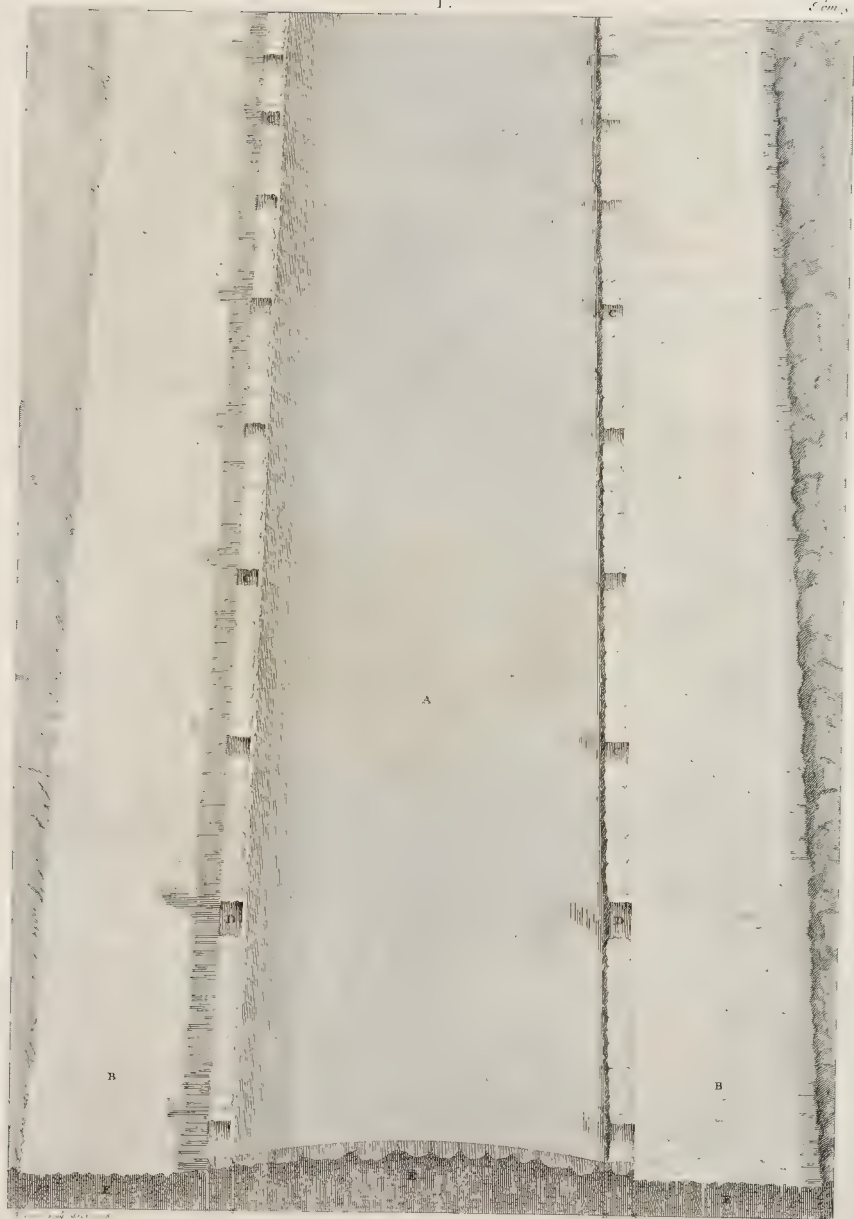
M. Double Porticos that defend both from Rain in Winter, and Sun in Summer.

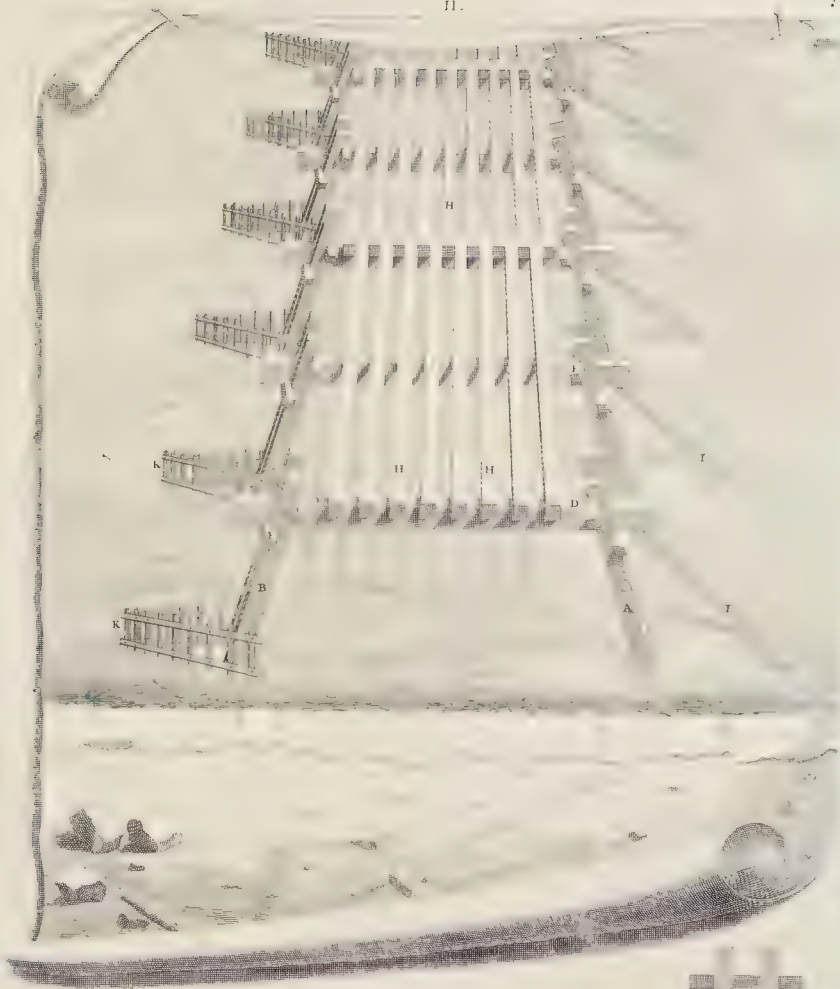
V. These Arches are the same, as those of the Temple of Peace.

X. These Arches a *Crochiera* are commonly called Groinings.

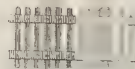
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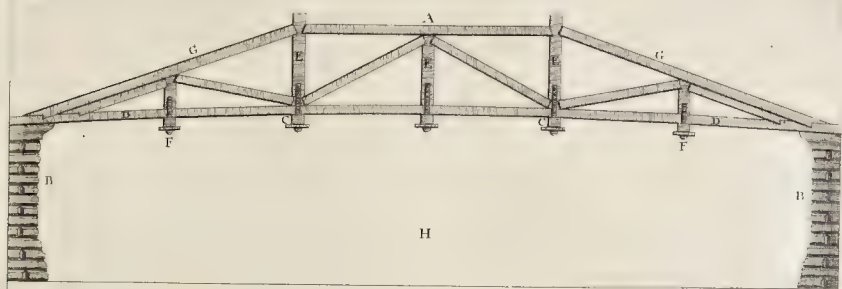


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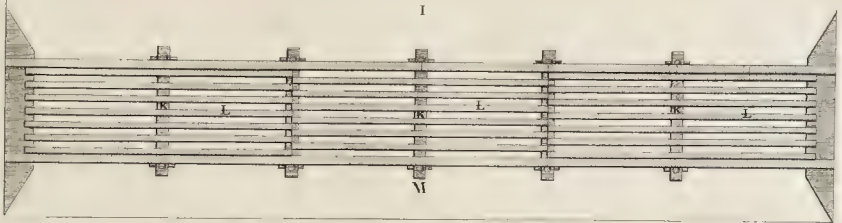
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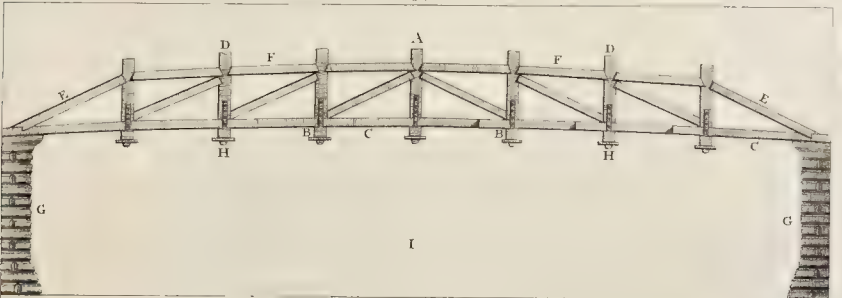
III



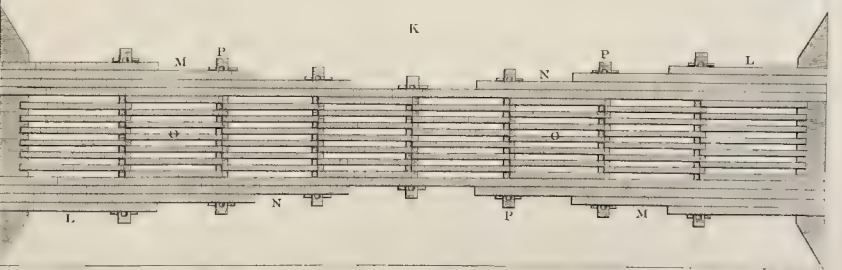
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IV

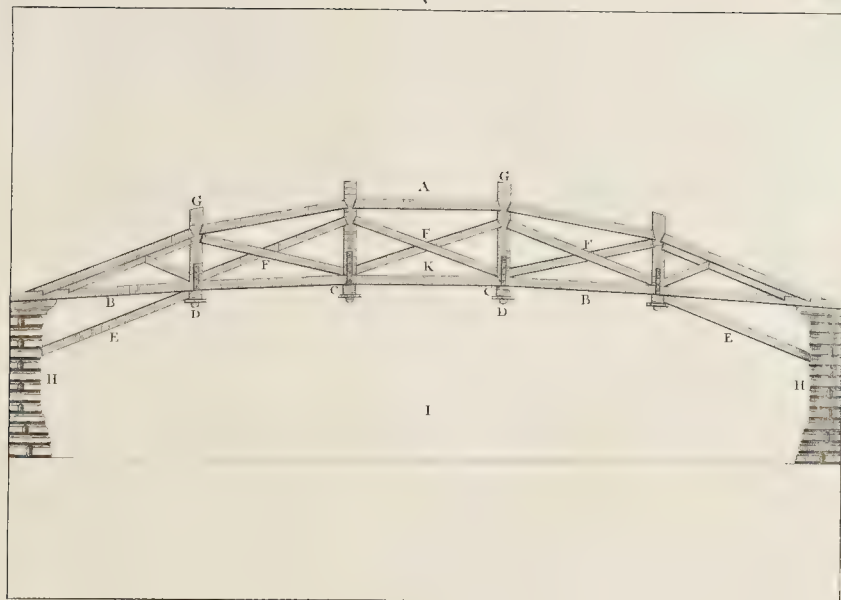


K

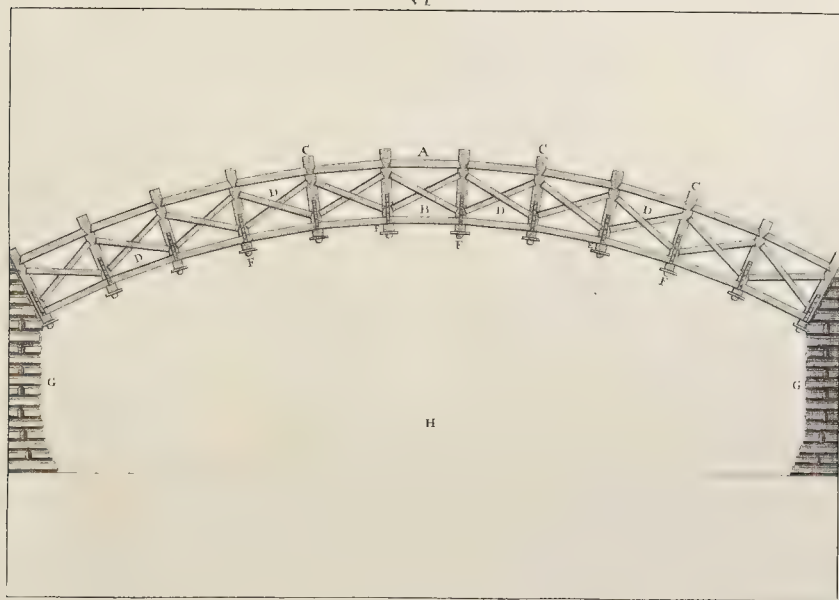


V

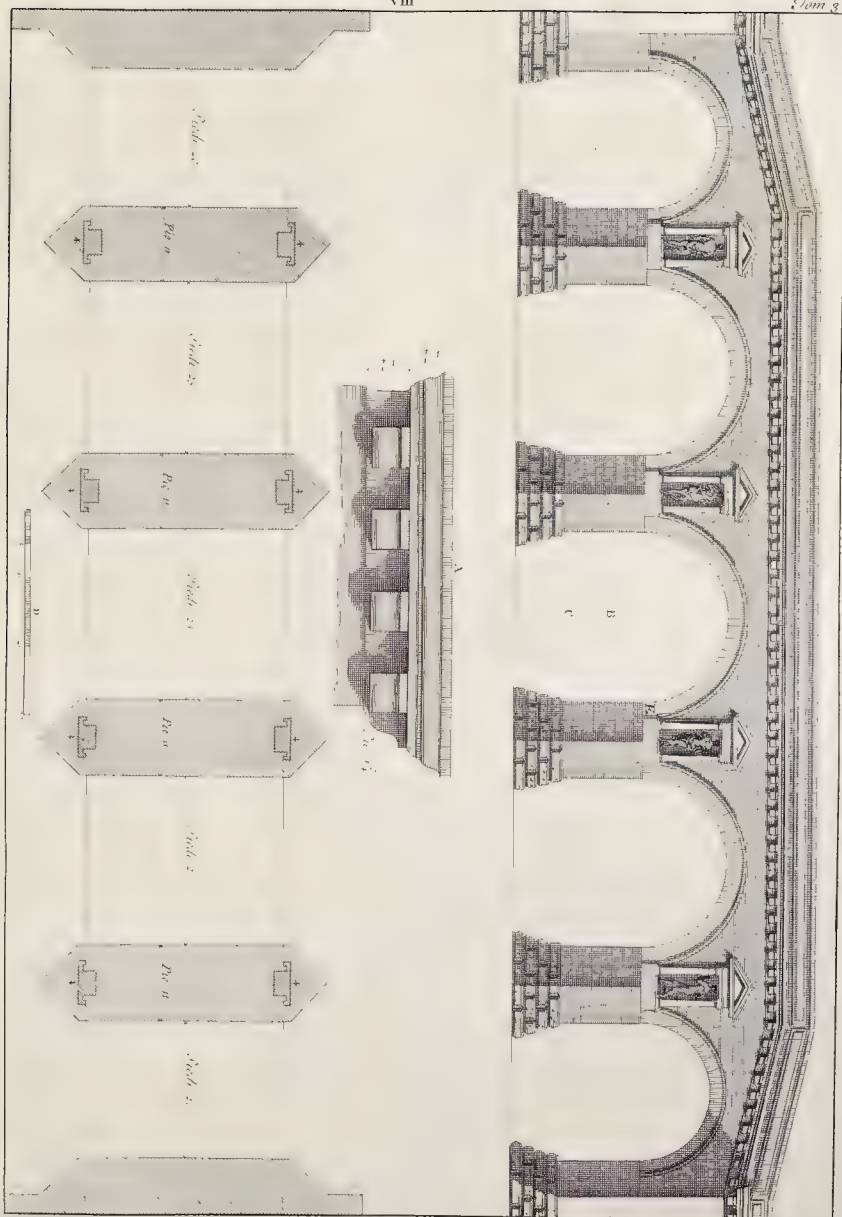
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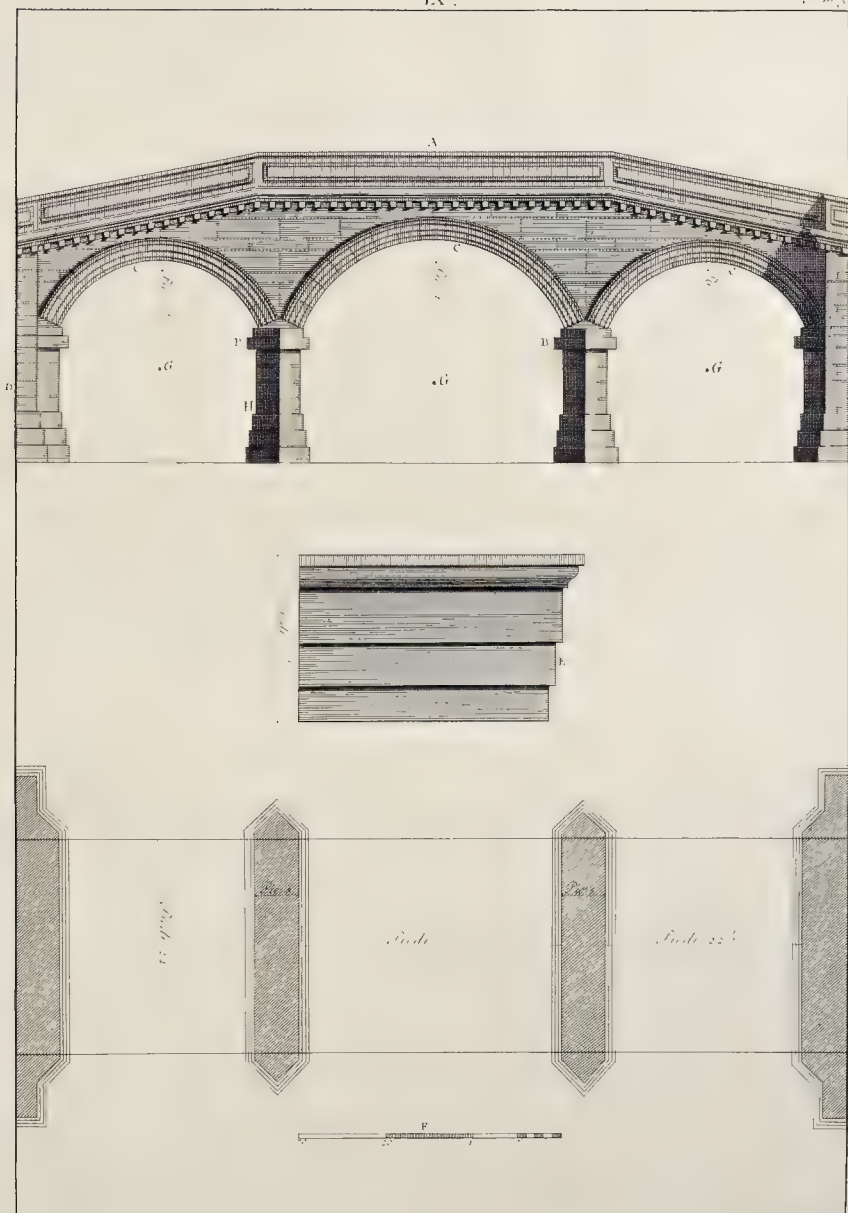


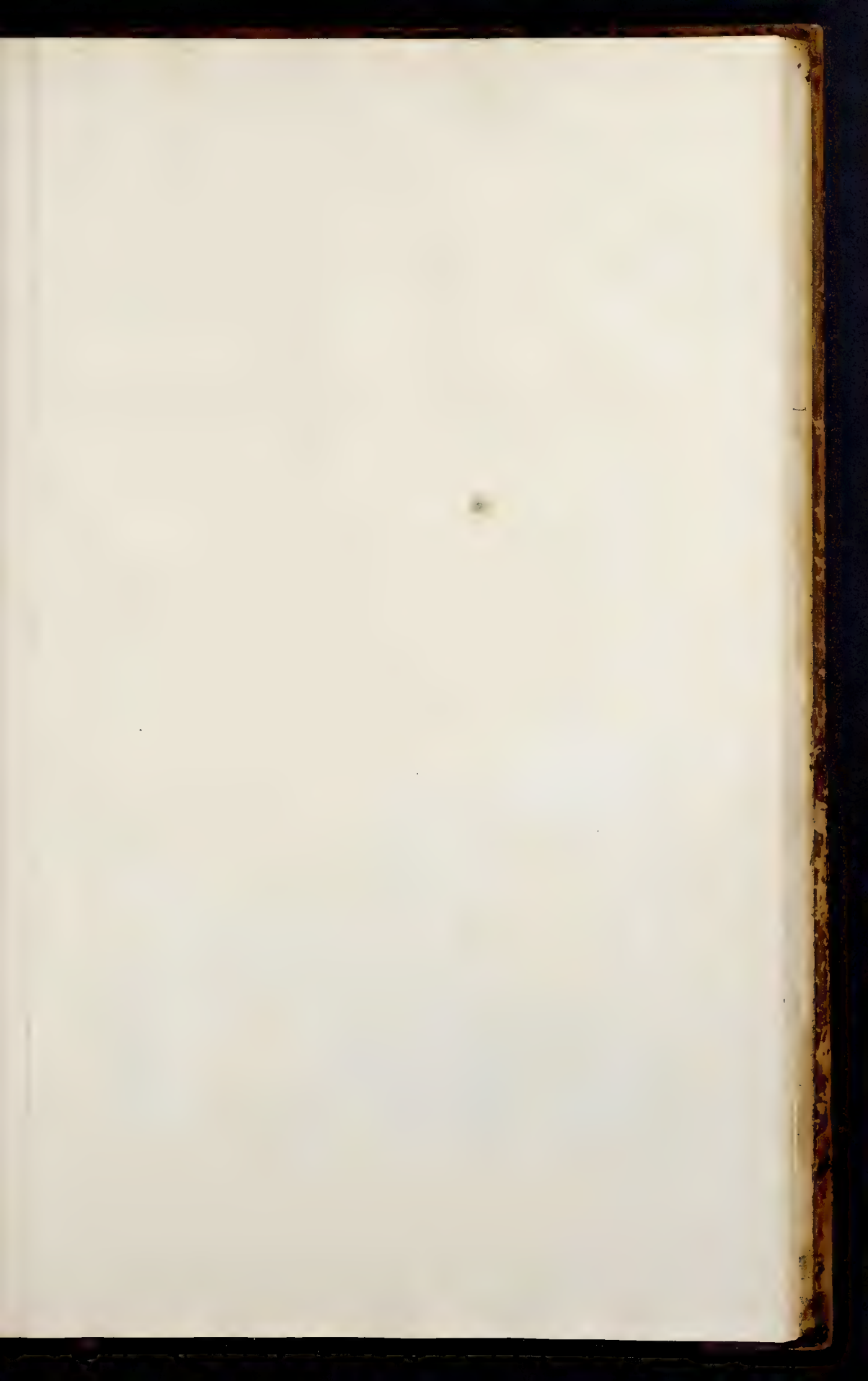
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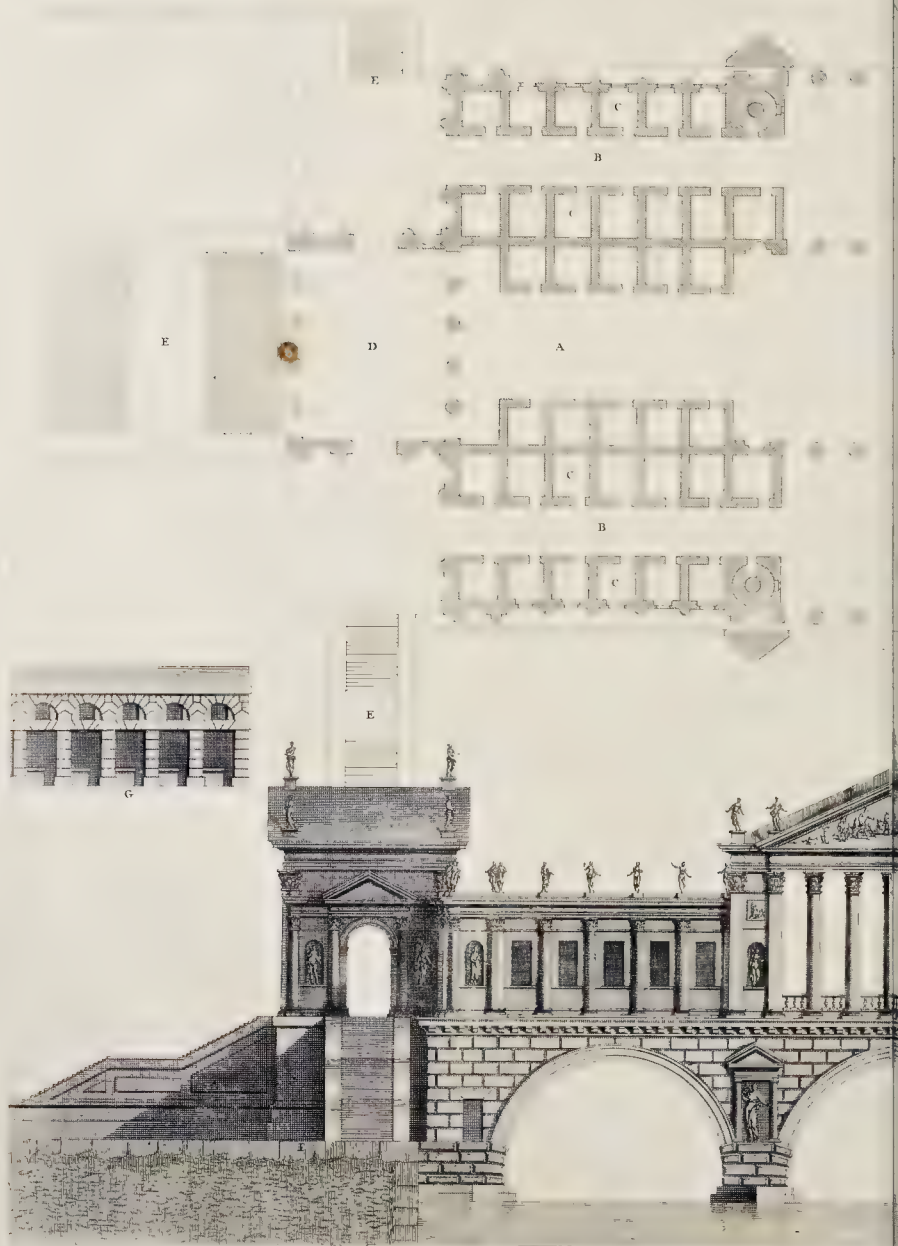




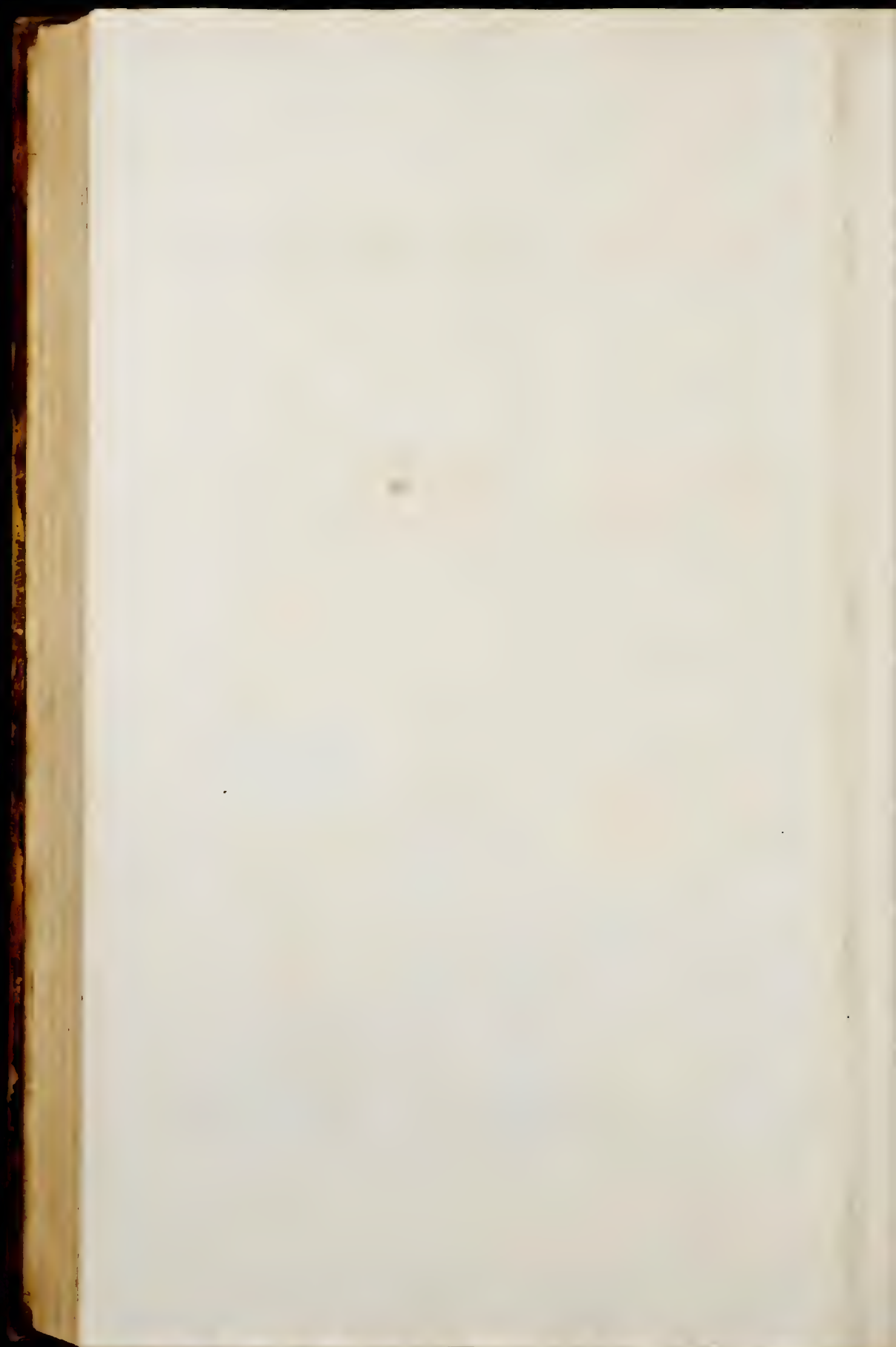


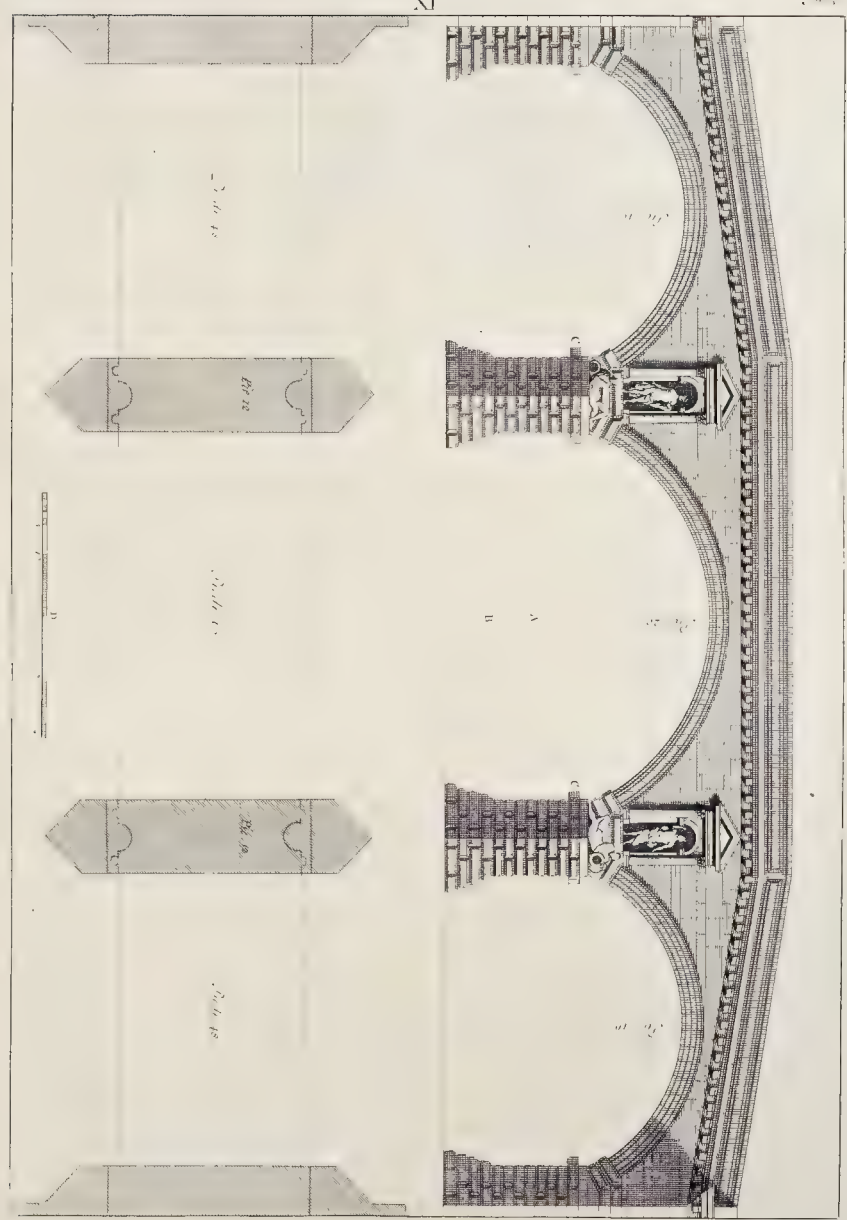


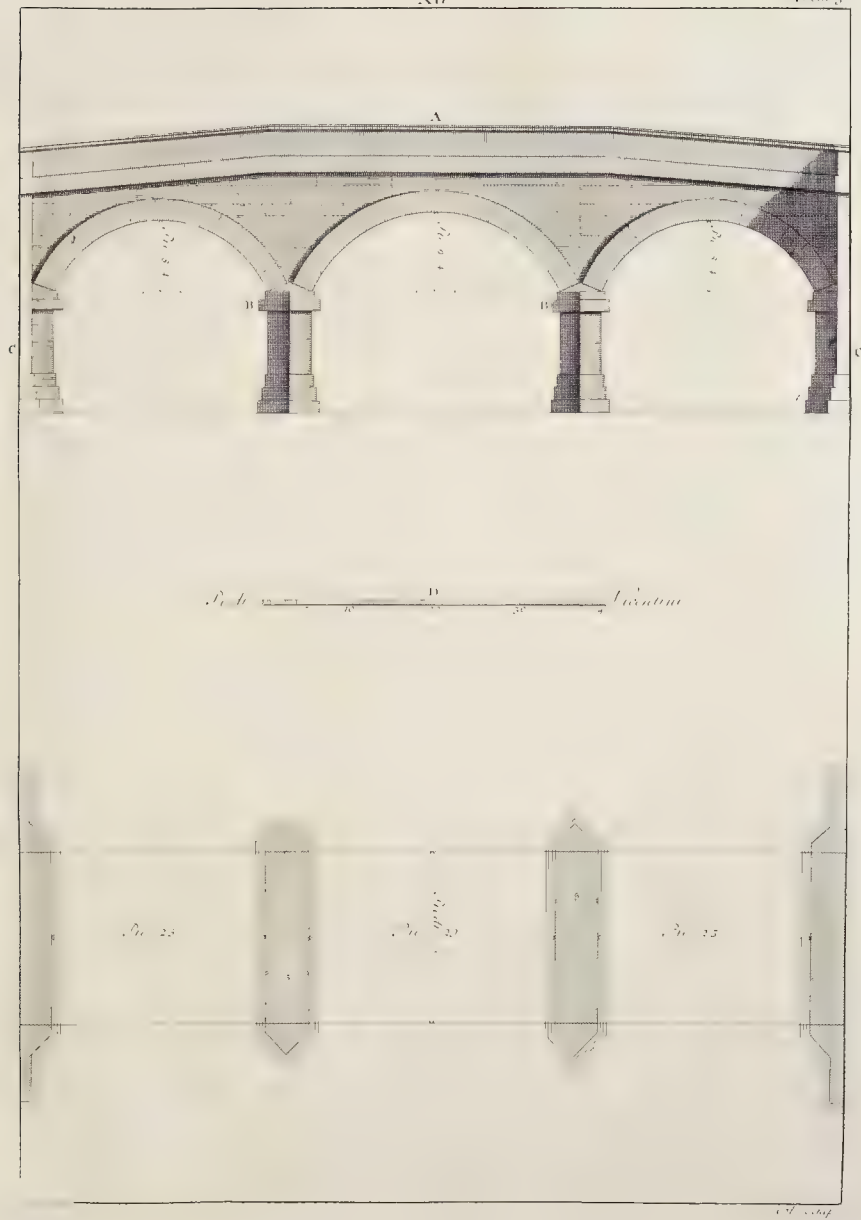


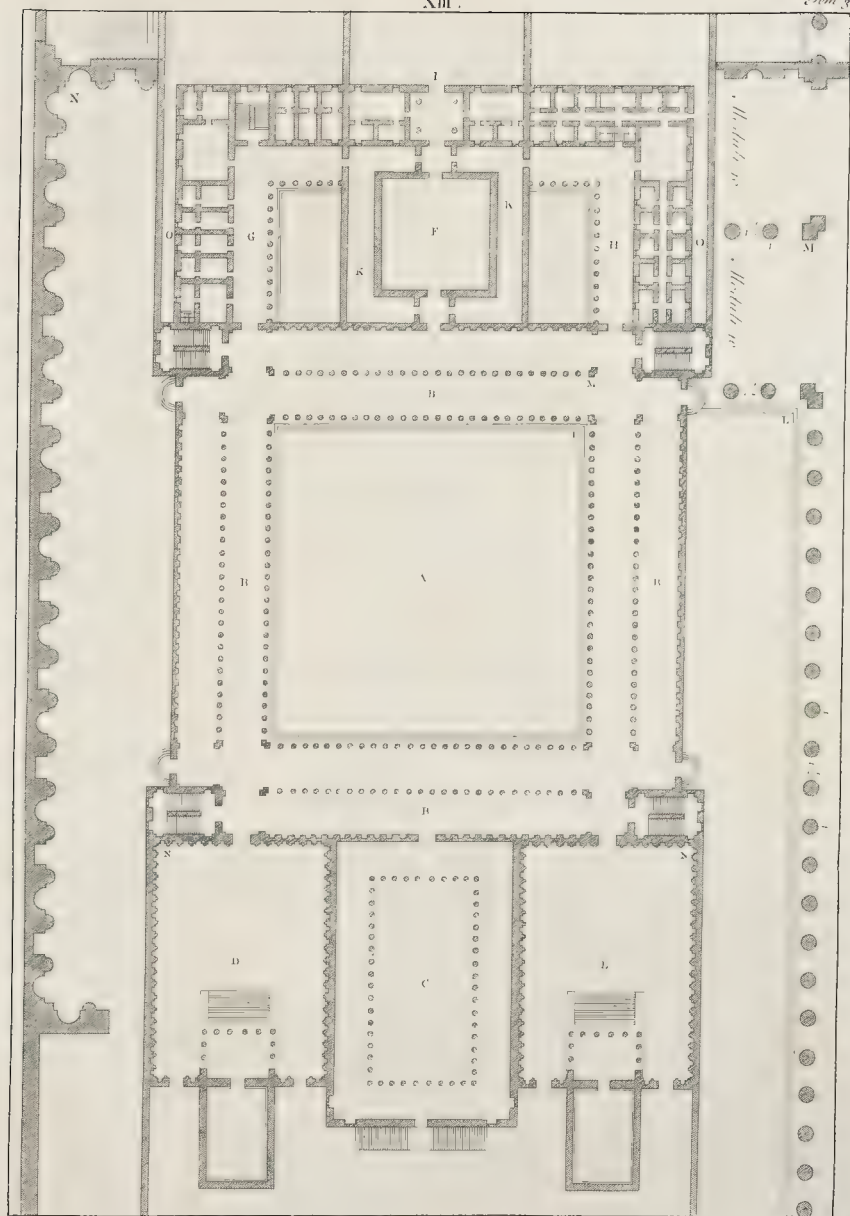














M. d. 1/2

Q



M. 1/2



M. 1

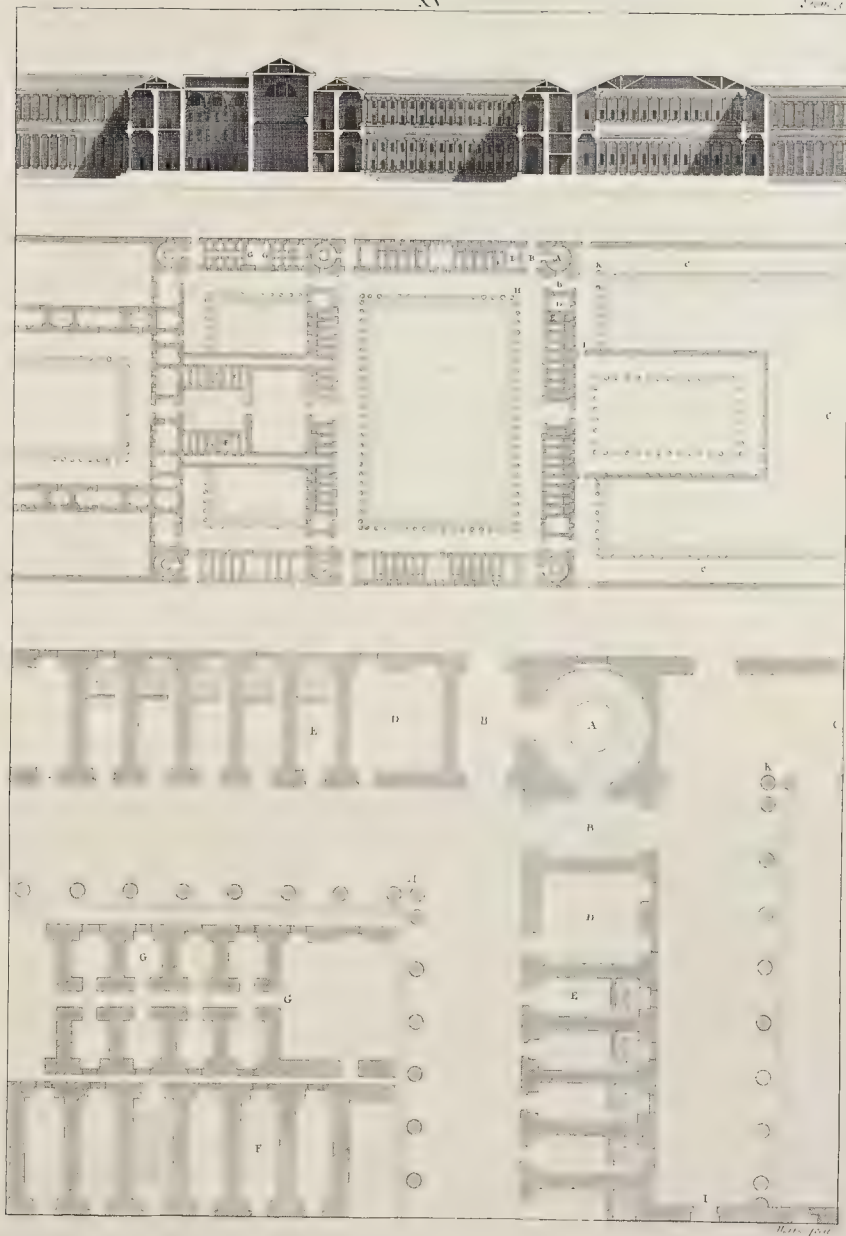


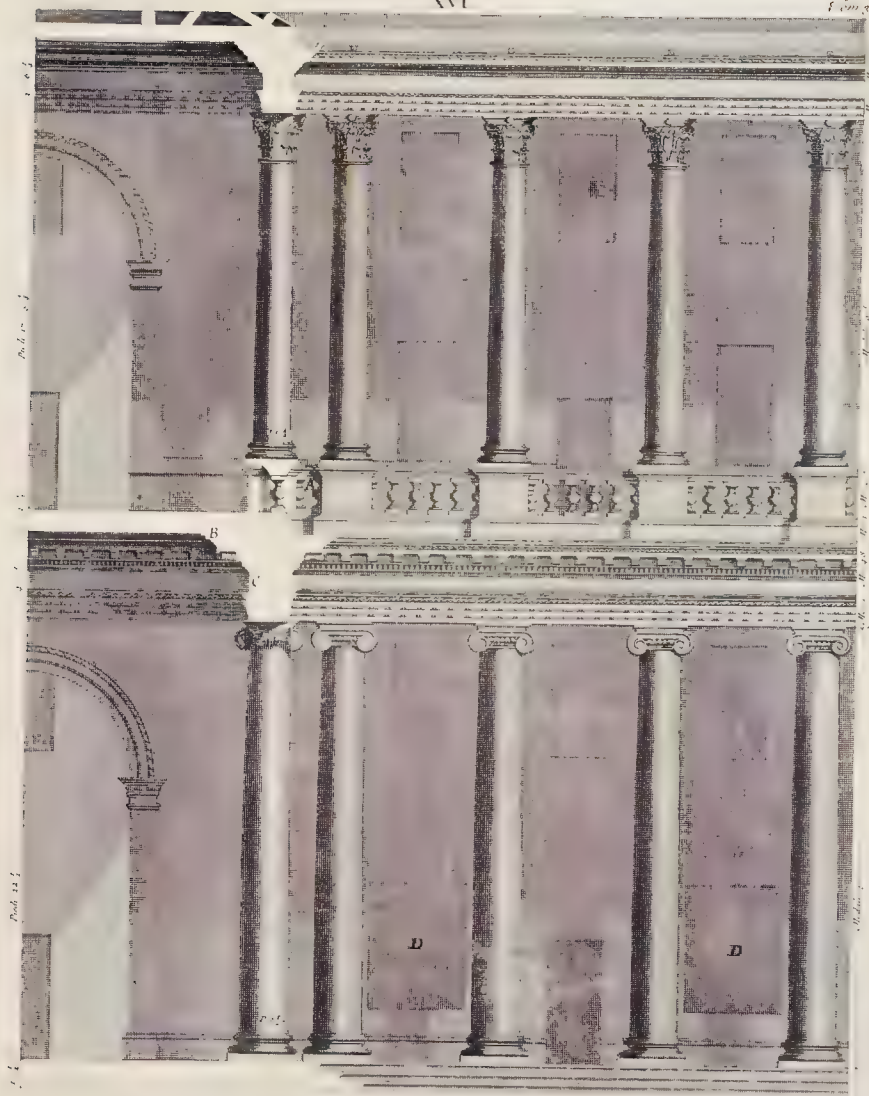
M. 1/2



M. 1/2







L

Mod. 4 $\frac{1}{2}$ h. c.

Mod. 1

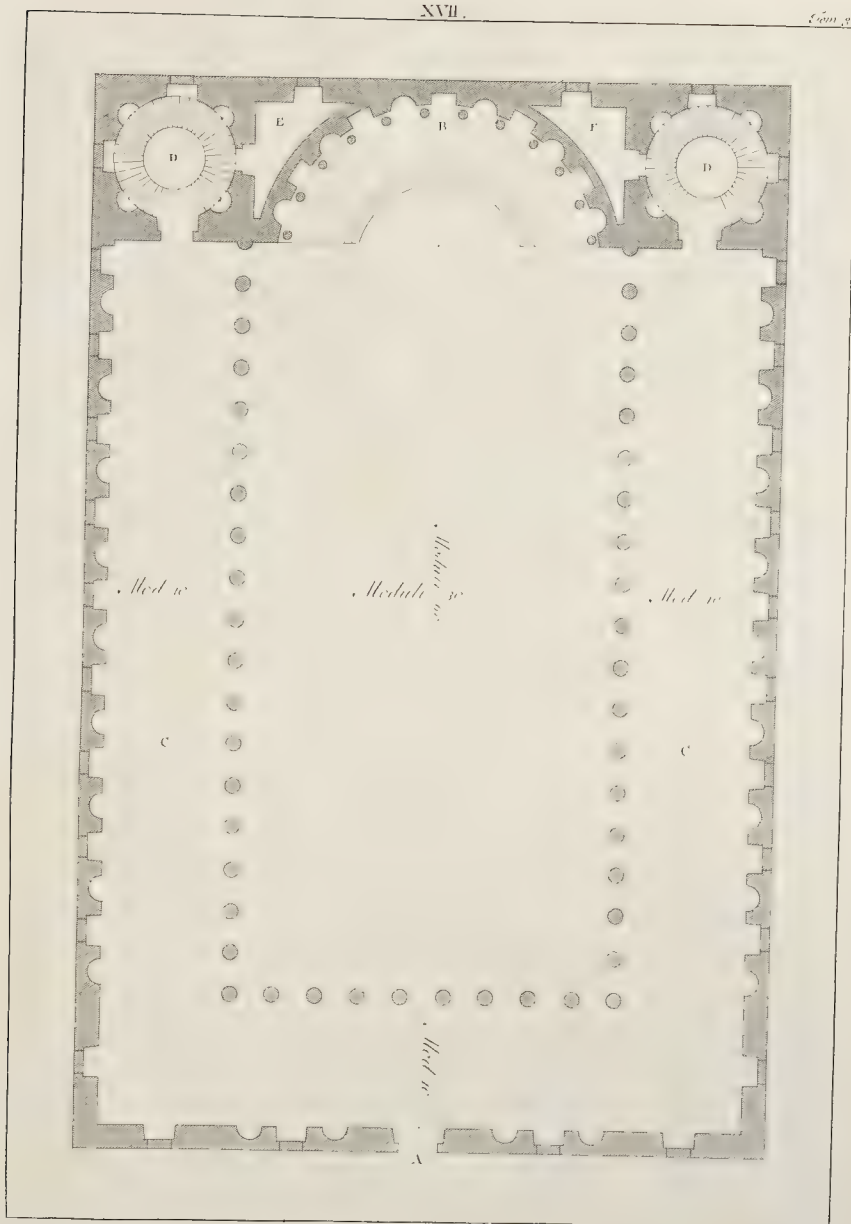
Fig. 2

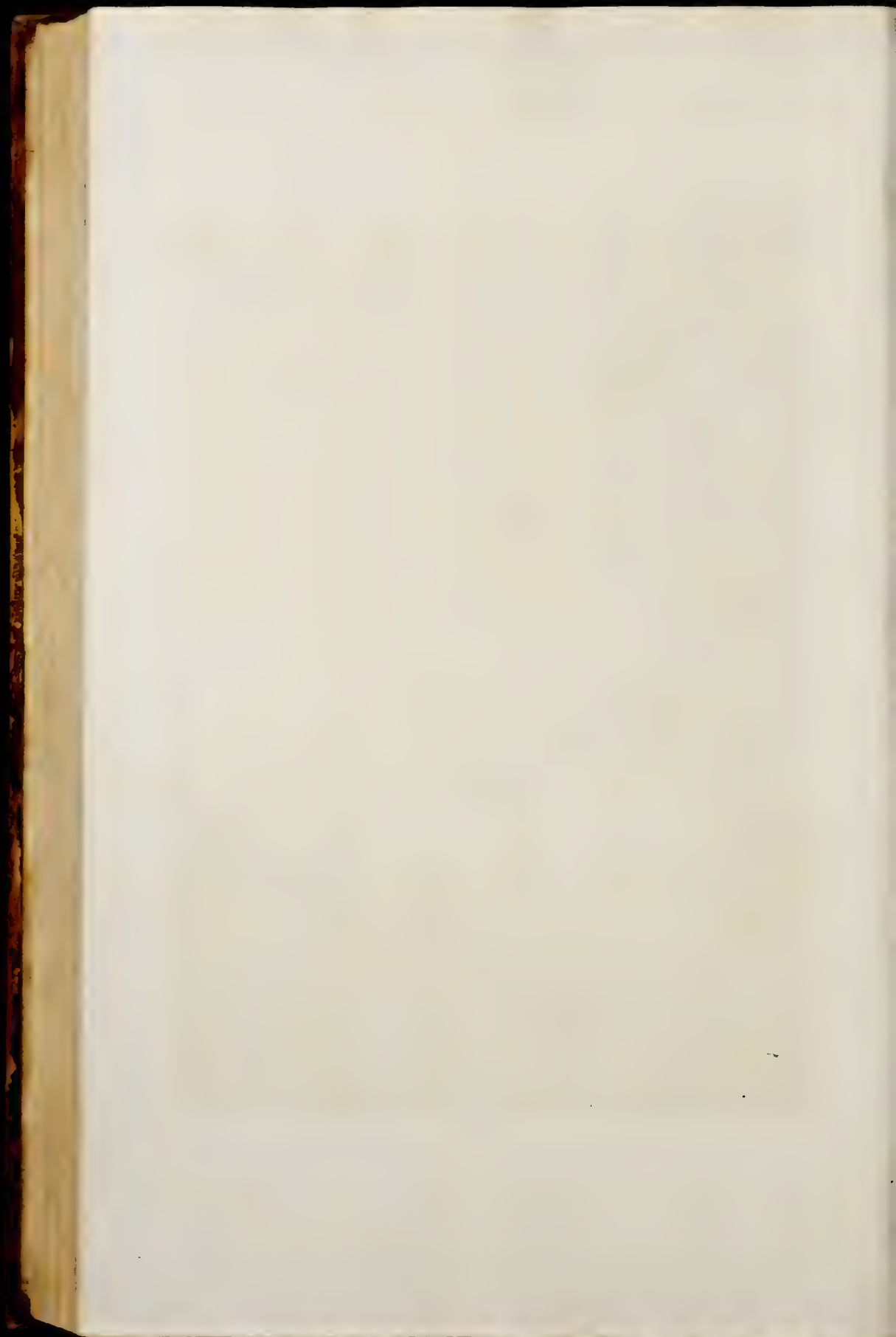
Mod. 4 $\frac{1}{2}$ h. c.
con front. 2 $\frac{1}{2}$

Mod. 2

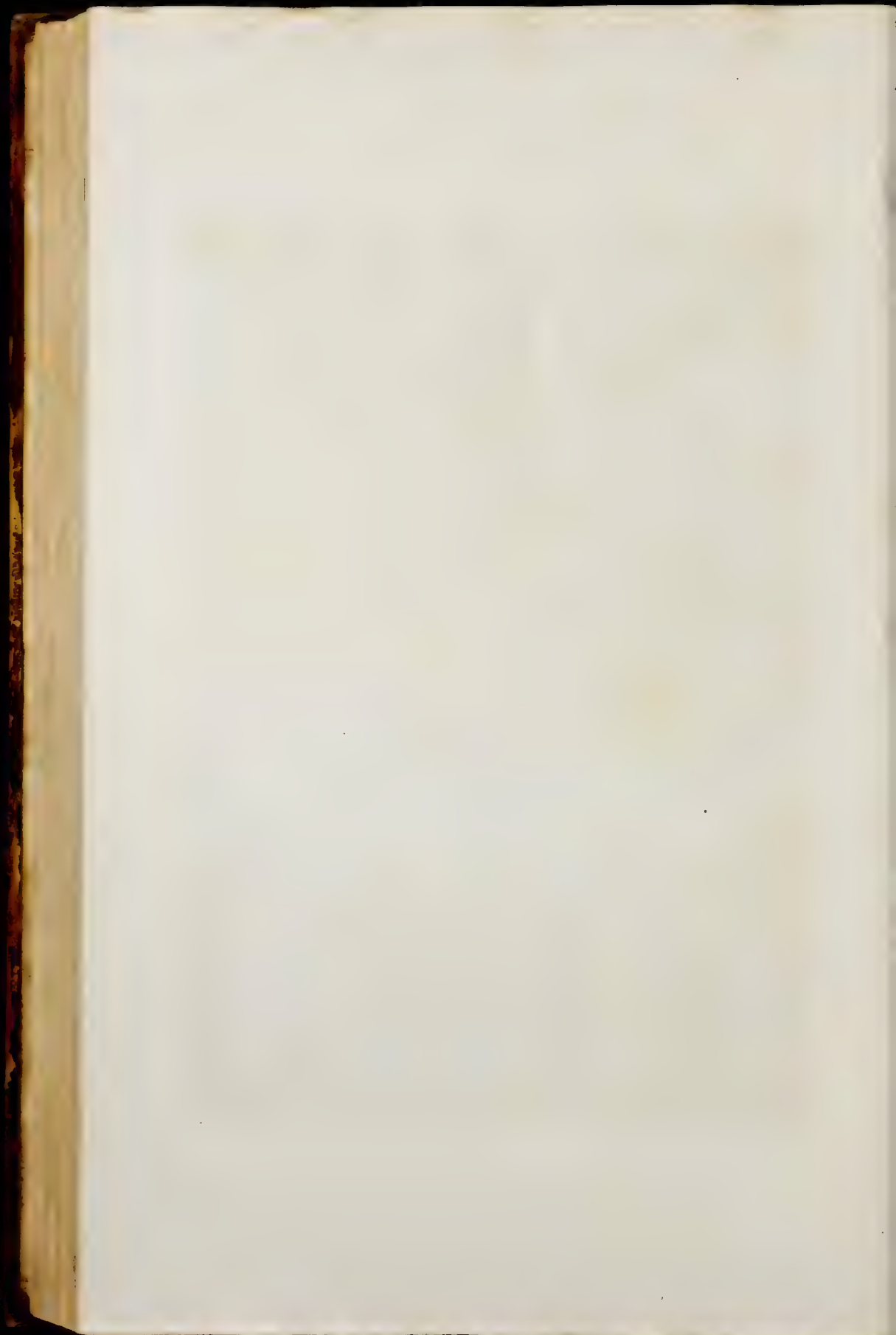
Mod. 1

Sim. Port. 21 f. con front.
il. Mod. 2 p. 1. c.
* Port. con front. 21 f.

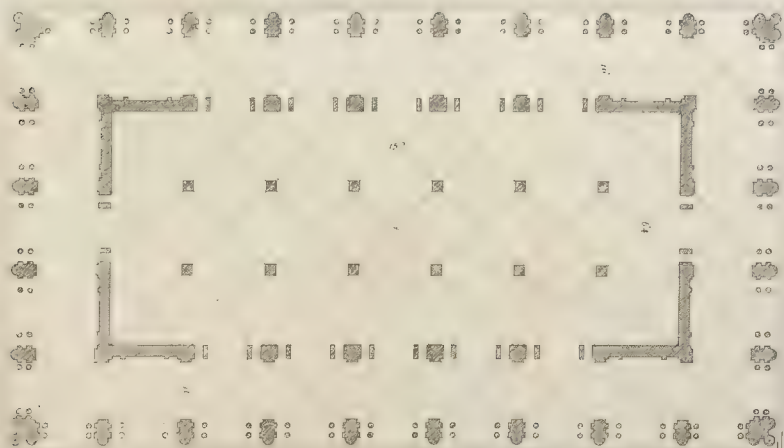
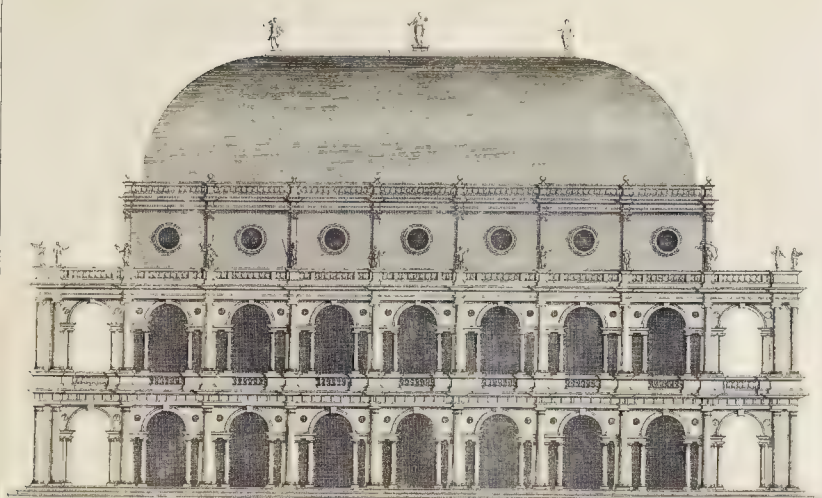




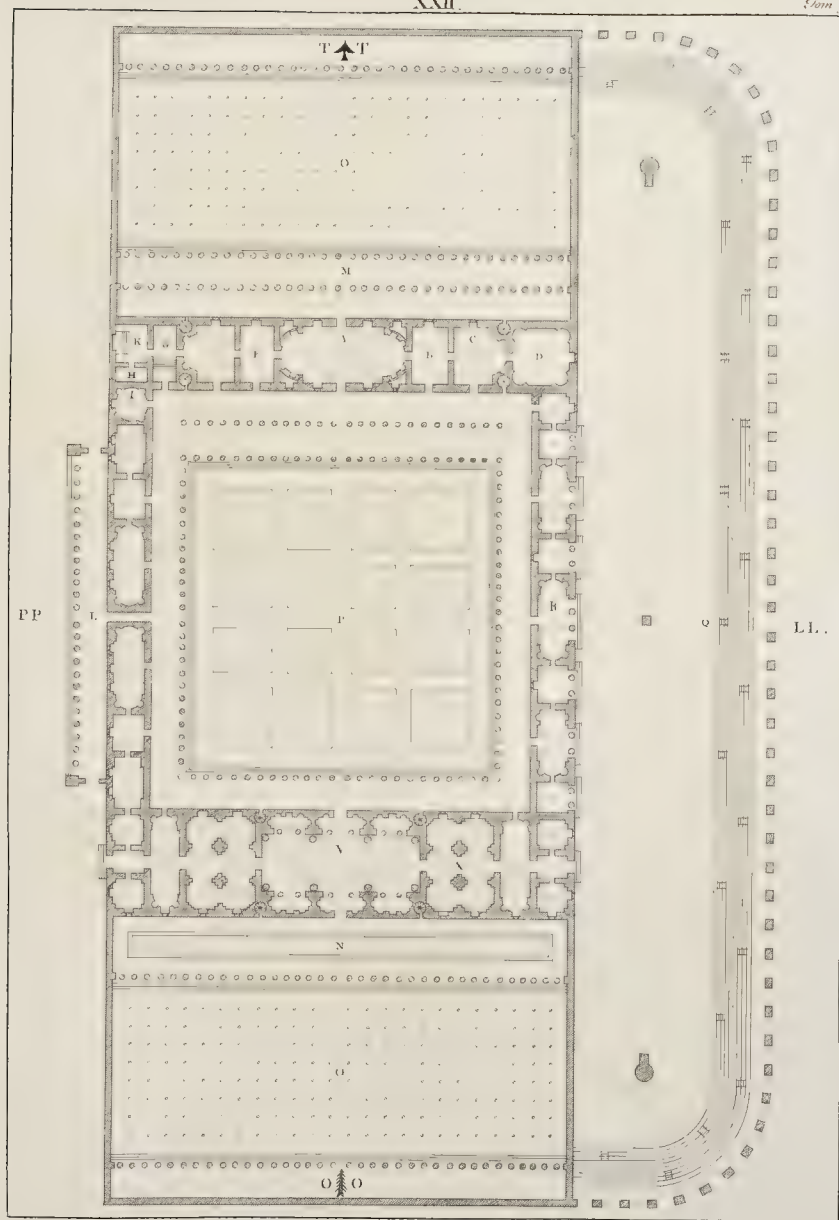


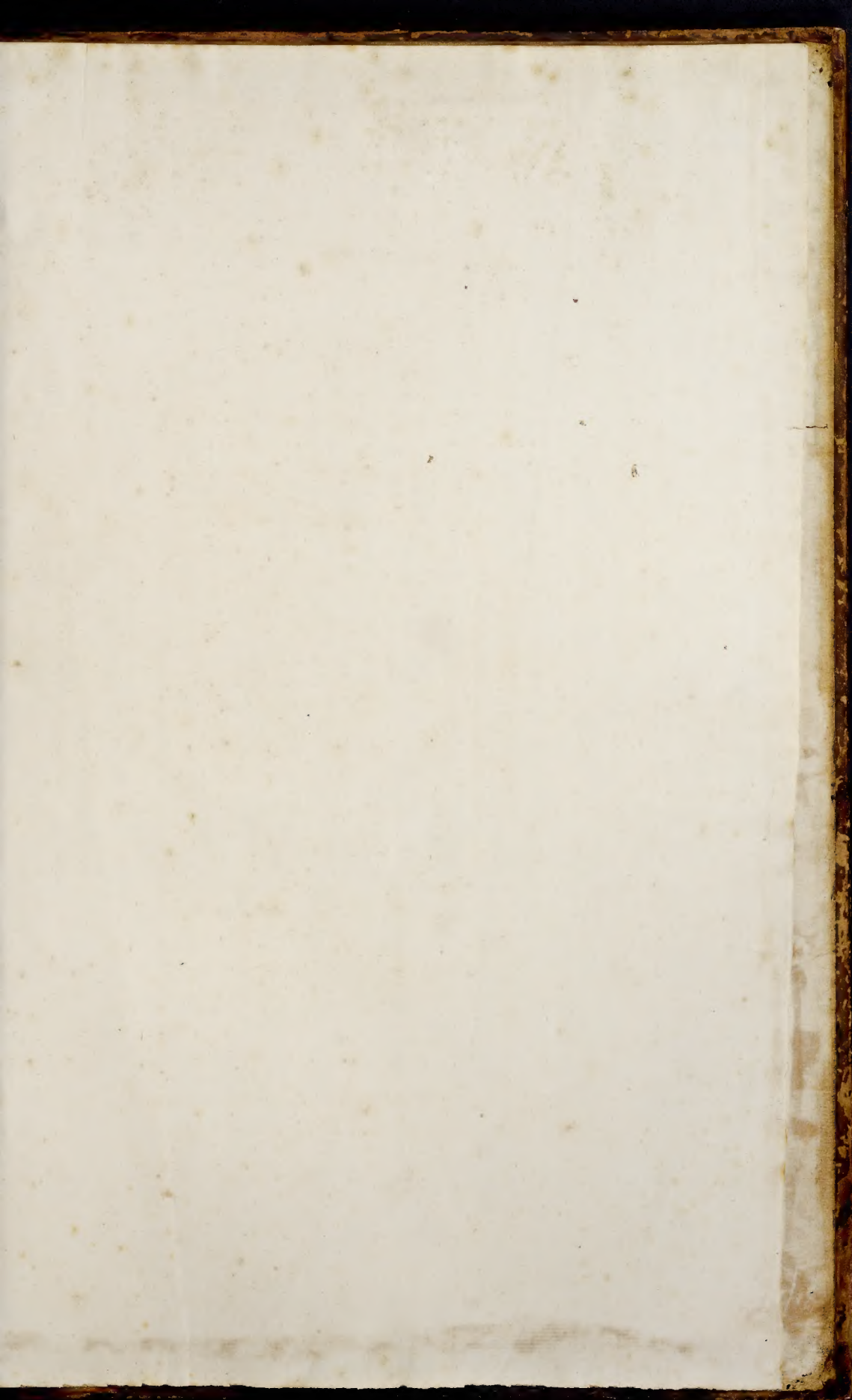












1211

186

RA 706
XSF1/2

1211
SPECIAL 85-B
OVERSIZE H801
v.1

